

In the Matter Of:

*VF OUTDOOR, LLC*

vs

*COCONA, INC.*

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*DR. CHARLES A. DANIELS*

*December 07, 2018*

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1 UNITED STATES PATENT AND TRADEMARK OFFICE

2 BEFORE THE PATENT TRIAL AND APPEAL BOARD

3

4 VF OUTDOOR, LLC, )

5 Petitioner, )

6 vs. ) CASE IPR2018-00190  
PATENT 8,945,287

7 COCONA, INC., )

8 Patent Owner. )

9

10 - - - - -  
11 THE DEPOSITION OF DR. CHARLES A. DANIELS  
12 FRIDAY, DECEMBER 7, 2018  
13 - - - - -

14 The deposition of DR. CHARLES A. DANIELS, called  
15 by the Petitioner for examination, taken before me,  
16 the undersigned, Sarah R. Drown, a Registered  
17 Professional Reporter and Notary Public within and  
18 for the State of Ohio, taken at the offices of Cady  
19 Reporting Services, Inc., Western Reserve Building,  
20 1469 West 9th Street, Suite 440, Cleveland, Ohio,  
21 commencing at 8:57 a.m., the day and date above set  
22 forth.

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24

25

Job No. MP-200299

<p>Page 2</p> <p>1 APPEARANCES:</p> <p>2</p> <p>3 On behalf of the Petitioner:</p> <p>4 Peter A. Gergely, Esq.</p> <p>5 Merchant &amp; Gould P.C.</p> <p>6 767 Third Avenue, 23rd Floor</p> <p>7 New York, New York 10017</p> <p>8 (212) 223-6520</p> <p>9 Pgergely@merchantgould.com</p> <p>10</p> <p>11 On behalf of the Patent Owner:</p> <p>12 Jacob Song, Esq.</p> <p>13 Kutak Rock LLP</p> <p>14 5 Park Plaza, Suite 1500</p> <p>15 Irvine, California 92614</p> <p>16 (949) 417-0999</p> <p>17 Jacob.song@kutakrock.com</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>	<p>Page 4</p> <p>1 Petitioner's Exhibit Daniels 16..... 141</p> <p>2 Petitioner's Exhibit Daniels 17..... 209</p> <p>3</p> <p>4</p> <p>5</p> <p>6</p> <p>7</p> <p>8</p> <p>9</p> <p>10</p> <p>11</p> <p>12</p> <p>13</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>
<p>Page 3</p> <p>1 W I T N E S S I N D E X</p> <p>2 PAGE</p> <p>3 EXAMINATION</p> <p>4 DR. CHARLES A. DANIELS</p> <p>5 BY MR. GERGELY..... 5</p> <p>6 EXAMINATION</p> <p>7 BY MR. SONG..... 215</p> <p>8 REEXAMINATION</p> <p>9 BY MR. GERGELY..... 223</p> <p>10</p> <p>11 E X H I B I T I N D E X</p> <p>12 EXHIBIT PAGE</p> <p>13 Petitioner's Exhibit Daniels 1..... 6</p> <p>14 Petitioner's Exhibit Daniels 2..... 31</p> <p>15 Petitioner's Exhibit Daniels 3..... 49</p> <p>16 Petitioner's Exhibit Daniels 4..... 52</p> <p>17 Petitioner's Exhibit Daniels 5..... 68</p> <p>18 Petitioner's Exhibit Daniels 6..... 77</p> <p>19 Petitioner's Exhibit Daniels 7..... 77</p> <p>20 Petitioner's Exhibit Daniels 8..... 80</p> <p>21 Petitioner's Exhibit Daniels 9..... 91</p> <p>22 Petitioner's Exhibit Daniels 10..... 95</p> <p>23 Petitioner's Exhibit Daniels 11..... 109</p> <p>24 Petitioner's Exhibit Daniels 12..... 109</p> <p>25 Petitioner's Exhibit Daniels 13..... 126</p> <p>26 Petitioner's Exhibit Daniels 14..... 138</p> <p>27 Petitioner's Exhibit Daniels 15..... 141</p>	<p>Page 5</p> <p>1 DR. CHARLES A. DANIELS</p> <p>2 of lawful age, called by the Petitioner for</p> <p>3 examination, having been first duly sworn, as</p> <p>4 hereinafter certified, was examined and testified</p> <p>5 as follows:</p> <p>6 EXAMINATION OF DR. CHARLES A. DANIELS</p> <p>7 BY MR. GERGELY:</p> <p>8 Q Good morning, sir.</p> <p>9 A Good morning.</p> <p>10 Q Please state your name.</p> <p>11 A Dr. Charles Daniels.</p> <p>12 Q What do you do for a living?</p> <p>13 A Well, at the current time I have a small</p> <p>14 consulting business which is basically me. I</p> <p>15 do some consultation work on polymer materials</p> <p>16 and a portion of my time is spent on matters</p> <p>17 such as this as a testifying or technical</p> <p>18 expert in various cases.</p> <p>19 Q How did Cocona find you for this case? Was it</p> <p>20 through a finder service?</p> <p>21 A Yes, I believe it was.</p> <p>22 Q Do you know which one?</p> <p>23 A IMS.</p> <p>24 Q Are your bills being routed through IMS, or</p> <p>25 were they paid a flat fee and you're now</p>

<p style="text-align: right;">Page 6</p> <p>1 sending your bills to counsel?</p> <p>2 A No, I'm paid by IMS.</p> <p>3 Q You've given a deposition before?</p> <p>4 A Yes.</p> <p>5 Q So you know the ground rules?</p> <p>6 A I do.</p> <p>7 Q So just briefly, your counsel may be making</p> <p>8 some objections, but you have to answer subject</p> <p>9 to those objections, unless he instructs you</p> <p>10 not to answer, say on grounds of</p> <p>11 attorney-client privilege or a similar type of</p> <p>12 objection.</p> <p>13 MR. GERGELY: I'm going mark</p> <p>14 exhibits using the witness' last name and then</p> <p>15 1, 2, 3. Why don't we call this Daniels 1.</p> <p>16 - - - - -</p> <p>17 (Petitioner's Exhibit Daniels 1 was marked.)</p> <p>18 - - - - -</p> <p>19 Q Sir, I've handed you what's been marked as</p> <p>20 Deposition Exhibit Number 1.</p> <p>21 Is this your declaration that you</p> <p>22 submitted in this case?</p> <p>23 A It is.</p> <p>24 Q How was it prepared?</p> <p>25 A It was a collaborative effort.</p>	<p style="text-align: right;">Page 8</p> <p>1 that.</p> <p>2 A Well, actually, there weren't any drafts. I</p> <p>3 mean it was the subject of really a lot of</p> <p>4 conversations. So when we arrived at this, it</p> <p>5 was just a compilation of all of the various</p> <p>6 conversations that we had on the subject</p> <p>7 matter.</p> <p>8 Q Right. But do you recall who actually typed</p> <p>9 the first draft? Was it you or was it counsel?</p> <p>10 MR. SONG: Objection.</p> <p>11 That's going to call for privilege and work</p> <p>12 product.</p> <p>13 MR. GERGELY: Are you</p> <p>14 instructing the witness not to answer?</p> <p>15 MR. SONG: I'm instructing</p> <p>16 the witness not to answer.</p> <p>17 Q Sir, is Mr. Song representing you today in this</p> <p>18 deposition?</p> <p>19 A He is.</p> <p>20 Q Sir, would you describe yourself as a polymer</p> <p>21 chemist?</p> <p>22 A I think that's a fair description, yes.</p> <p>23 Q Do you have any expertise with respect to the</p> <p>24 behavior of particles?</p> <p>25 A Yes.</p>
<p style="text-align: right;">Page 7</p> <p>1 Q Did you do the first draft or did counsel?</p> <p>2 MR. SONG: Objection.</p> <p>3 Calls for privilege, work product.</p> <p>4 MR. GERGELY: Well, I think</p> <p>5 the process isn't -- I'm just asking if he did</p> <p>6 the first draft.</p> <p>7 MR. SONG: You're calling</p> <p>8 for specific information as to work product and</p> <p>9 attorney-client privilege communications.</p> <p>10 MR. GERGELY: Well, I</p> <p>11 disagree. What's the privilege?</p> <p>12 MR. SONG: You're asking</p> <p>13 him about how the document came together.</p> <p>14 MR. GERGELY: Right.</p> <p>15 MR. SONG: That's getting</p> <p>16 into substance.</p> <p>17 MR. GERGELY: No, it's not.</p> <p>18 MR. SONG: Because you're</p> <p>19 getting into component pieces of the document.</p> <p>20 MR. GERGELY: No, I'm just</p> <p>21 asking as a matter of process who did the first</p> <p>22 draft.</p> <p>23 MR. SONG: All right.</p> <p>24 I'll allow the witness to answer.</p> <p>25 MR. GERGELY: I appreciate</p>	<p style="text-align: right;">Page 9</p> <p>1 Q What is that?</p> <p>2 A Well, when I began my career way back when, I</p> <p>3 was actually the principal scientist for a</p> <p>4 characterization laboratory, which I had a</p> <p>5 specific role which was in particle size and</p> <p>6 surface area and kinds of analyses, developing</p> <p>7 methods to measure those.</p> <p>8 Q What was the name of that lab?</p> <p>9 A It was actually called at the time BFGoodrich</p> <p>10 Company and was in the chemical division of the</p> <p>11 BFGoodrich Company specifically broken into</p> <p>12 various parts. Tires and aerospace and</p> <p>13 chemicals.</p> <p>14 Q You were measuring particle size?</p> <p>15 A Yes. We had the challenge to develop methods</p> <p>16 to automate and get higher precision</p> <p>17 measurements of particle size of a variety of</p> <p>18 materials because they were utilized in</p> <p>19 compounds and actually in some cases were the</p> <p>20 result of production processes that we</p> <p>21 developed.</p> <p>22 Q How would you measure particle size?</p> <p>23 A Well, there are a number of ways. Today most</p> <p>24 methods are based on laser light scattering</p> <p>25 techniques, but there have been a number of</p>

<p style="text-align: right;">Page 10</p> <p>1 methods that have been employed over the years, 2 including devices that today are incorporated 3 in measuring your blood cell counts. 4 <b>Q So like a Coulter counter?</b> 5 A Precisely. 6 <b>Q So Coulter counters, those were available back,</b> 7 <b>say, at the time of this invention at issue in</b> 8 <b>this case, 2005?</b> 9 A They were. They had actually started to become 10 replaced by other let's say easier to utilize 11 methods, but yes, a Coulter counter and what it 12 morphed into was certainly available. 13 <b>Q How about surface area of particles, how is</b> 14 <b>that measured?</b> 15 A Well, we had a catalyst group that 16 predominantly used these methods. They were 17 kind of next door us. They used gas adsorption 18 methods. So it's based on a technique known as 19 BET. 20 <b>Q What does that mean?</b> 21 A Well, it's name after three scientists, and I 22 believe it's Brunauer, Emmett, Teller. And 23 basically what you attempt to do is measure the 24 amount of gas that's absorbed onto conditioned 25 particles and from that be able to calculate</p>	<p style="text-align: right;">Page 12</p> <p>1 <b>the mesopores, and the macropores?</b> 2 A Yeah. You were actually looking at the volume 3 in between particles. If they were stacked 4 together or compressed, you were looking at the 5 pores between what we call primary particles. 6 It became a science quite onto itself. 7 <b>Q Sir, in your declaration on page 7, you list</b> 8 <b>the materials that you reviewed --</b> 9 A Yes. 10 <b>Q -- in connection with your declaration, is that</b> 11 <b>correct?</b> 12 A That's correct. 13 <b>Q Did you review any additional materials</b> 14 <b>preparing for today's deposition?</b> 15 A No. I think later in the document I cite a 16 specific exhibit in this section in which we're 17 talking about doing some experimental work. So 18 I kind of left it there, it was a specific 19 thing. But no, this captures all of the 20 pertinent documents. 21 <b>Q So you met with Mr. Song to prepare, though,</b> 22 <b>for today, correct?</b> 23 A Yes. 24 <b>Q Did he show you any additional documents beyond</b> 25 <b>what's on this list?</b></p>
<p style="text-align: right;">Page 11</p> <p>1 the surface area of the materials. 2 <b>Q How about pore volume, would you ever calculate</b> 3 <b>pore volume?</b> 4 A Yes. Our pore volume analyses in the 5 laboratory in which I worked were predominantly 6 done by an intrusion method called mercury 7 porosimetry. And it's just what it sounds 8 like. 9 You know, pressurized mercury and drive 10 it into the pores of the substance that you're 11 interested in. And from that you could 12 calculate how much is taken up by the mass of 13 materials that you were testing. 14 <b>Q Any other metrics you would measure for</b> 15 <b>particles?</b> 16 A Well, you would look at porosity distribution, 17 because not every particle is the same as every 18 other, and particle size itself is really a 19 measure of the distribution of particle sizes. 20 So you would get a distribution of the sizes, 21 the breadth of the sizes, whether there was one 22 or two or more populations present. It got 23 kind of intricate, depending upon what systems 24 you were looking at. 25 <b>Q So are you referring to, say, the micropores,</b></p>	<p style="text-align: right;">Page 13</p> <p>1 A I don't believe -- 2 MR. SONG: Objection. 3 THE WITNESS: Sorry. 4 MR. SONG: Calls for 5 privilege, work product. I'll allow the 6 witness to answer. 7 A No, I don't believe so. 8 MR. GERGELY: Yeah, I mean, 9 technically it's not under the Federal Rules of 10 Evidence. Documents shown to a witness are not 11 privileged. 12 A No. 13 <b>Q Okay. How about: Did you review any</b> 14 <b>transcripts in the case?</b> 15 A Well, the ones that are listed here. The 16 transcripts of depositions -- 17 <b>Q Correct.</b> 18 A -- for example? 19 <b>Q There's been a couple depositions taken this</b> 20 <b>week.</b> 21 A Oh. No. No. No. I think the only one I 22 reviewed in any detail was Dr. Albert's 23 deposition. I don't believe any of the others 24 are cited or I have seen or examined. 25 <b>Q Do you know that there's another expert that's</b></p>

<p style="text-align: right;">Page 14</p> <p>1     <b>been retained by Cocona in this case named</b></p> <p>2     <b>Mr. Calen [phonetic]?</b></p> <p>3     A   I've never met him and I don't know anything</p> <p>4         about it.</p> <p>5     Q   <b>Okay. But have you heard that?</b></p> <p>6     A   Yesterday Mr. Song mentioned that there was</p> <p>7         another expert, but just in passing.</p> <p>8     Q   <b>Okay. So you've never talked to him?</b></p> <p>9     A   No, I have not.</p> <p>10    Q   <b>Have you talked to anyone at Cocona in this</b></p> <p>11         <b>case, say Dr. Haggquist or Mr. Bowman?</b></p> <p>12    A   No.</p> <p>13    Q   <b>Sir, I'd like to draw your attention to your</b></p> <p>14         <b>declaration on page 13 at paragraph 39.</b></p> <p>15    A   Yes.</p> <p>16    Q   <b>For about three and a half pages or so you</b></p> <p>17         <b>provide a discussion of the differences between</b></p> <p>18         <b>absorption and adsorption. Why did you do</b></p> <p>19         <b>that?</b></p> <p>20    A   Well, I believe that Dr. Haggquist's '287</p> <p>21         patent is based on technology that utilizes</p> <p>22         materials that adsorb and some of the patents</p> <p>23         cited as allegedly being talk about absorption.</p> <p>24         And distinction I believe is important in order</p> <p>25         to understand the science of one versus the</p>	<p style="text-align: right;">Page 16</p> <p>1     sized home but in a gram of material. And it</p> <p>2     has pores and it has capacity. And when the</p> <p>3     process starts, you go from basically nothing</p> <p>4     on the surface in the way it adsorbs material</p> <p>5     to a surface which can eventually become I'll</p> <p>6     use the word saturated, although that can be</p> <p>7     confusing in the two processes.</p> <p>8         But you use up all of the available</p> <p>9     surface area and potentially it may stop. Its</p> <p>10    surface area is consumed. But the material of</p> <p>11    interest, the adsorbing particle, doesn't</p> <p>12    undergo any other kind of chemical change, it</p> <p>13    doesn't swell to any noticeable degree.</p> <p>14    Anything that happens is the outside volume.</p> <p>15    The outside surface may get thicker</p> <p>16    microscopically, but that's it. It's still a</p> <p>17    solid and there's your end point.</p> <p>18         In an absorbing material, the other side</p> <p>19    of the fence, you can start out with any</p> <p>20    physical form. It could be a film, it could be</p> <p>21    a powder, it could be a gel, it could be a</p> <p>22    pellet.</p> <p>23         And let's talk about a hydrophilic</p> <p>24    material, one that loves water. What will</p> <p>25    happen with that is you get a moving front of</p>
<p style="text-align: right;">Page 15</p> <p>1     science of the other.</p> <p>2     Q   <b>Okay. I appreciate that.</b></p> <p>3         MR. GERGELY:         Just go off the</p> <p>4         record for a second.</p> <p>5         - - - - -</p> <p>6         (Discussion held off the record.)</p> <p>7         - - - - -</p> <p>8     BY MR. GERGELY:</p> <p>9     Q   <b>Now, sir, in paragraph 39 you state, "These two</b></p> <p>10         <b>processes produce different end points, mass</b></p> <p>11         <b>changes, and degrees of reversibility."</b></p> <p>12         <b>Do you see that?</b></p> <p>13    A   I do.</p> <p>14    Q   <b>What do you mean by "different end points"?</b></p> <p>15    A   Well, let's talk about adsorption first.</p> <p>16         In an activated particle or one which can</p> <p>17    adsorb a material, they'll start at a point</p> <p>18    where there's zero or near zero utilization of</p> <p>19    the activated surface by materials for which</p> <p>20    this was designed to adsorb. So in the case</p> <p>21    we'll talk about moisture because it's the</p> <p>22    easiest one.</p> <p>23         So you start out with a clean surface of</p> <p>24    a high surface area, pick a number. 3,000</p> <p>25    square feet per gram in a room in a fairly nice</p>	<p style="text-align: right;">Page 17</p> <p>1     the water passing through the solid particle</p> <p>2     and into the solid particle. And that solid</p> <p>3     particle starts to at a molecular scale relax.</p> <p>4     New volume is created within it because there's</p> <p>5     an interaction between what its absorbing in</p> <p>6     the molecules of the active substance, the</p> <p>7     substance of interest.</p> <p>8         That may end up being totally dissolved.</p> <p>9     It may be like taking a few grams of sugar and</p> <p>10    putting it in warm water and stirring it around</p> <p>11    and the sugar absorbs the water, disperses in</p> <p>12    the water, and now it's gone to the naked eye.</p> <p>13         So the endpoint is different. You've now</p> <p>14    created molecules that will move around a lot</p> <p>15    more freely. They're surrounded by the</p> <p>16    materials. And that's important, surrounded by</p> <p>17    the materials that they absorbed, and it's not</p> <p>18    a surface phenomenon.</p> <p>19         It may be a long answer, but I hope the</p> <p>20    movie version of it is much more illuminating.</p> <p>21    Q   <b>And then you also refer to "mass changes."</b></p> <p>22         <b>What do you mean by "mass changes"?</b></p> <p>23    A   Well, in an adsorbent particle, certainly when</p> <p>24    I put something on it, because the surface is</p> <p>25    active, the weight of the system may go up</p>

<p style="text-align: right;">Page 18</p> <p>1 slightly, depending upon how much of that is 2 absorbed.</p> <p>3 When I absorb a liquid, and let's just 4 say I get to the stage where it's swelling, 5 maybe it's a cross length material of some 6 hydrophilic nature, it's going to take not only 7 volume from using water as an example, but that 8 mass will be additive to the particle that it's 9 absorbing into. So the sum of this new mass 10 will be all of that stuff and a lot more water 11 because a lot more can get in as it moves into 12 the particle.</p> <p>13 <b>Q So for an adsorbing substance, how do you</b> 14 <b>measure, say, how much water is adsorbed?</b></p> <p>15 A Well, that's a challenging chemical 16 measurement. You have to do it either by some 17 measure of the surface area that's free prior 18 to what's free after.</p> <p>19 If you have a really, really good 20 balance, you might be able to measure the mass 21 change, but it's going to be relatively small 22 compared to let's say the absorbent system, 23 which is just going to increase in volume and 24 increase in mass by a lot more.</p> <p>25 <b>Q Okay. But for both systems there is a mass</b></p>	<p style="text-align: right;">Page 20</p> <p>1 coffee out and all of the coffee evaporates, 2 which I hope no one ever does, you end up with 3 this sort of crusty thing on the bottom of your 4 coffee cup if you use sugar. It doesn't look 5 like the original sugar physically.</p> <p>6 <b>Q You say, "Absorption is a process in which a</b> 7 <b>fluid is dissolved by a liquid or a solid."</b></p> <p>8 A You can also do it with a gas. You can also do 9 it with a gas.</p> <p>10 <b>Q So the fluid is actually dissolving in</b> 11 <b>absorption?</b></p> <p>12 A In absorption -- well, it depends on which one 13 you want to call the solute or the solvent. 14 Let's talk about it in words a lot of sugar and 15 a little bit of water.</p> <p>16 If I put the water in there, then the 17 water is being dissolved by the sugar. If I 18 take a little bit of the sugar and I put it in 19 the water, the water is the other way around.</p> <p>20 But you end up with a solution in any 21 case, which is homogeneous. The absorbed case 22 is still heterogeneous because you can -- 23 there's distinct areas that are let's say 24 carbon, and distinct areas which are the 25 absorbed moisture.</p>
<p style="text-align: right;">Page 19</p> <p>1 change, correct?</p> <p>2 A Yes. This is a magnitude of the mass change 3 that is different.</p> <p>4 <b>Q Okay.</b></p> <p>5 A By orders of magnitude.</p> <p>6 <b>Q And then "degrees of reversibility." What is</b> 7 <b>that?</b></p> <p>8 A Well, it is much simpler to take an adsorbent 9 particle back to its native state, because the 10 way I'm going to -- again using water as an 11 example -- remove it, it might be heat, it 12 might be vacuum, but it's just going to have to 13 come off of the surface.</p> <p>14 It doesn't have to in the case of the 15 absorbent system come all of the way out of the 16 middle, as well as the surface, as you remove 17 the substance and try to get back to its 18 original form.</p> <p>19 And in many, many cases in the absorbent 20 case you don't get back to -- if I started with 21 a particle, I might end up with a lump or a 22 film. If I remove the water and I still have 23 the film, I don't get back to the original 24 physical nature from which I may have started.</p> <p>25 So, for example, when I leave my cup of</p>	<p style="text-align: right;">Page 21</p> <p>1 <b>Q In your sugar water example, either the -- so</b> 2 <b>the sugar has to be soluble, correct, in order</b> 3 <b>to dissolve the water?</b></p> <p>4 A The water has to be soluble or the sugar has to 5 be soluble in the water.</p> <p>6 Now, there are systems, some hydrophilic 7 polymers in this case, where the complete 8 solution process may not take place because 9 they're crosslinked. Then they'll just simply 10 swell.</p> <p>11 <b>Q Right. So there are hydrophilic polymers that</b> 12 <b>are insoluble, correct?</b></p> <p>13 A Yes. To the naked eye they are insoluble, 14 right.</p> <p>15 <b>Q So how is that working?</b></p> <p>16 A Well, in those cases what you have is a 17 network. The network is in a solid state more 18 or less collapsed. As the water enters, the 19 network begins to expand and it imbibes then 20 this water until such point as the molecules 21 can't stretch out any farther and they've taken 22 up all the fluid that they can.</p> <p>23 <b>Q That network, is that a 3D network?</b></p> <p>24 A Yes.</p> <p>25 <b>Q So what's the surface of that 3D network?</b></p>

<p style="text-align: right;">Page 22</p> <p>1 A The surface of the 3D network. I'm not sure 2 what you mean by that. 3 Usually when you have a swollen 4 hydrophilic polymer it looks like a gel, like a 5 hair gel or a gelled deodorant or something of 6 that sort. So the surface is really a 7 reflection of the container it's in. It 8 assumes the smooth. 9 Q Well, let me give you a specific example. 10 A Sure. 11 Q Like a Sephadex bead. What is the surface of a 12 Sephadex individual bead? 13 A Well, it's the chemical itself. It's the 14 chemical itself. 15 Q So both the exterior and the interior? 16 A Yes. When it starts out, it's probably fairly 17 homogenous and the bead contains the chemistry 18 of whatever the Sephadex composition is. 19 Q So water with respect to Sephadex is adhering 20 both to the outside and the inside? 21 A Well, it will start on the outside and move to 22 the inside and various chemical groups will 23 reorient themselves in order to interact with 24 the water. 25 Q You state, "Adsorption, on the other hand, is a</p>	<p style="text-align: right;">Page 24</p> <p>1 surface because it's not just the outer 2 circumference, it has to take into account all 3 of the ups and downs and ins and outs. 4 Q In activated carbon, how deep do those pores 5 typically go into the particle? 6 A I've never measured that. So I don't know. 7 Q I mean are they -- you know, if an activated 8 carbon were, say, 10 microns in diameter, is it 9 fair to say that those cracks go down near to 10 the middle? 11 MR. SONG: Objection. It 12 calls for speculation. 13 A I honestly don't know. I've never made that 14 kind of measurement. 15 Q Okay. Have you seen activated carbon particles 16 depicted? 17 A Well, we've actually see them under the 18 microscope. Yes. 19 Q You can see them? 20 A Yes. 21 Q Were you able to obtain a high resolution so 22 you could actually see those pores beneath the 23 surface of the material? 24 A We could see the pores but not -- if I took the 25 particle and tipped it on end, we were unable</p>
<p style="text-align: right;">Page 23</p> <p>1 process in which atoms, ions, or molecules from 2 a substance (e.g., gas, liquid, or dissolved 3 solid) adhere to a surface of the adsorbent." 4 Do you see that? 5 A Yes. 6 Q You go on to state, "Adsorption is a 7 surface-based process wherein a film of 8 adsorbate is created on the surface while 9 absorption involves the entire volume of the 10 absorbing substance." 11 A Yes. 12 Q What do you mean by "a film of adsorbate is 13 created on the surface"? 14 A Well, again standing back from it, what you 15 would see is a layer around the surface of the 16 adsorbed particle, the adsorbent. We'll use 17 water as the adsorbent because it can be an 18 example. So the surface is enriched with these 19 water molecules, which again standing back from 20 it, look like it might be a film. 21 Q Okay. Say, for example, activated carbon, the 22 water molecules will penetrate the perimeter of 23 the particle as well, correct? 24 A They'll go into the pores because that's part 25 of the surface. And an important part of the</p>	<p style="text-align: right;">Page 25</p> <p>1 to see them in terms of their penetration 2 distance. So that's why I can't answer your 3 question. 4 Q Sir, I'm handing you an exhibit that was marked 5 in Dr. Haggquist's deposition. It was 6 Haggquist 4. 7 MR. SONG: I'm going to 8 object to the exhibit as to scope. It was not 9 cited or referenced in the witness' direct 10 testimony. The document was not identified in 11 the deposition notice for Dr. Daniels. The 12 document has not been authenticated. It lacks 13 foundation. 14 Q Sir, this document was marked during 15 Dr. Haggquist's deposition. I would like you 16 to turn to the second page. 17 Do you see the image there depicting -- 18 A Yes, I do. 19 Q -- a particle of activated carbon in cross 20 section? 21 A Yes, I do. 22 Q Do you see the text that says "Large and small 23 organic molecules" at the top? 24 MR. SONG: Objection. 25 It's beyond the scope. The document was not</p>

Page 26

1 cited or referenced in the witnesses' direct  
2 testimony. It is not identified in the  
3 deposition notice. It has not been  
4 sufficiently authenticated under 901, 902.  
5 Lacks foundation.  
6 MR. GERGELY: Counsel, you  
7 can have a standing objection.  
8 A I'm sorry. Where are you?  
9 Q I was asking a question about the image.  
10 Do you see where it says "Large and small  
11 organic molecules" at the top?  
12 A I do.  
13 MR. SONG: Sorry,  
14 Mr. Gergely. So you'll stipulate to a standing  
15 objection as to those grounds previously  
16 stated?  
17 MR. GERGELY: Yes. You don't  
18 have to keep repeating.  
19 MR. SONG: I appreciate  
20 that.  
21 Q Is this a fair depiction of an activated carbon  
22 pore?  
23 A Well, honestly I don't know. I've never seen  
24 this document before. As I've said to you  
25 earlier, not having actually done a

Page 27

1 cross-sectional analysis of an activated carbon  
2 particle, I really have no basis for  
3 comparisons.  
4 Q Okay. Have you in the course of your work as a  
5 person of ordinary skill in the art, have you  
6 seen scientific articles depicting activated  
7 carbon in this manner, with these deep pores?  
8 MR. SONG: Objection,  
9 vague and ambiguous as to "scientific  
10 articles."  
11 A I don't recall having seen anything that looked  
12 like this, no.  
13 Q Okay. What have you seen in terms of what the  
14 activated carbon pores look like in scientific  
15 articles?  
16 MR. SONG: Objection,  
17 vague and ambiguous as to "scientific  
18 articles."  
19 A My recollection -- and I have not examined a  
20 lot of articles on cross-sectional measurements  
21 of activated carbon. My only recollection is  
22 what is in the first let's say top portion of  
23 it, the pores themselves. I've not seen any  
24 references that actually look like what's  
25 depicted here.

Page 28

1 Q When you're saying "pores themselves," you're  
2 referring to the text?  
3 A The text?  
4 Q Yeah. You said something about the pores on  
5 the top.  
6 What did you mean by "pores on the top"?  
7 A Maybe it's easier to point to it. What I'm  
8 talking about is this just general area right  
9 in here.  
10 The interior portion, again, is not  
11 something I'm familiar with, whether that's an  
12 accurate depiction.  
13 MR. SONG: I'm sorry to  
14 interrupt. Peter, do you have a copy of that  
15 for me?  
16 MR. GERGELY: I don't. I  
17 assumed that your counsel was sending you the  
18 exhibits.  
19 Q So, just for the record, you were pointing to  
20 the image itself?  
21 A I was pointing to the image itself in the top  
22 portion of the image and not anything much  
23 below that, because, as I said, I don't have a  
24 point of reference and I have not looked at  
25 this document before. So I'm not even certain,

Page 29

1 you know, where it came from or what it's  
2 intended to represent.  
3 Q Regardless, you'll agree with me that in the  
4 case of activated carbon that's porous, the  
5 adsorbate is penetrating below the perimeter of  
6 the activated carbon?  
7 A Yes. Yes.  
8 MR. SONG: Objection,  
9 vague as to "perimeter."  
10 Q Sir, is the perimeter the outer surface?  
11 A Yeah. I think I used the word "circumference."  
12 Q Okay. Let's use "circumference."  
13 A Yes. So I believe my answer still stands.  
14 Yes, the particles, using perimeter as the  
15 measure or the indication of the sort of  
16 outside most -- outermost surface, certainly  
17 they will penetrate below it.  
18 Q Okay. I appreciate that, sir. Thank you.  
19 MR. SONG: I'm sorry. Did  
20 you mark that as D2?  
21 MR. GERGELY: I marked it as  
22 Haggquist 4. So it's a deposition exhibit in  
23 Haggquist.  
24 MR. SONG: So are you --  
25 MR. GERGELY: But we should

Page 30

1 probably also mark it in this deposition, just  
2 to be --

3 MR. SONG: Clear?  
4 MR. GERGELY: Yeah. I'm just  
5 trying to think how we're going to do this.  
6 MR. SONG: I think we were  
7 at D2, if you wanted to continue that  
8 nomenclature.

9 MR. GERGELY: Yeah. Do you  
10 have any issue with attaching the original to  
11 Haggquist and then attaching a copy to  
12 Dr. Daniels' deposition?  
13 MR. SONG: Attaching  
14 Dr. Haggquist's entire deposition to --  
15 MR. GERGELY: No. No. No.  
16 No. No. This is Haggquist 4, which has an  
17 original sticker on it.  
18 MR. SONG: Okay.  
19 MR. GERGELY: We can put  
20 another sticker on it and attach a copy to his  
21 deposition.  
22 MR. SONG: That's fine.  
23 MR. GERGELY: Okay. I  
24 appreciate that.  
25 MR. SONG: So that will

Page 31

1 just be number 2, then?  
2 MR. GERGELY: Yes.  
3 So we're going to put "Daniels 2" on this  
4 one.  
5 - - - - -  
6 (Petitioner's Exhibit Daniels 2 was marked.)  
7 - - - - -  
8 MR. GERGELY: Just for the  
9 record, we've marked Haggquist 4 also as  
10 Daniels 2. This is the document entitled "What  
11 is the Activated Carbon?"  
12 We've agreed between counsel that we'll  
13 attach the original to Dr. Haggquist's  
14 deposition and a copy to Dr. Daniels'. I  
15 appreciate that.  
16 MR. SONG: That's fine.  
17 BY MR. GERGELY:  
18 Q Sir, in paragraph 40 you state that "There is  
19 scientifically supportable evidence that, by  
20 definition, discriminates between processes  
21 that proceed by absorption versus adsorption.  
22 Adsorption is a process controlled by the  
23 surface activity and pore volume of the active  
24 substance."  
25 Do you see that?

Page 32

1 A Yes.  
2 Q And then you state that "The active substance  
3 has a defined limit of its adsorptive  
4 capacity."  
5 You go on to state, "By contrast, an  
6 absorptive substance often has an infinite  
7 capacity for the substance absorbed."  
8 Do you see that?  
9 A Yes.  
10 Q What do you mean by "infinite capacity"?  
11 A Well, because of the absorptive substance --  
12 I'm going to talk again in a case of something  
13 that isn't physically held together, a  
14 noncrosslinked version of an absorptive  
15 substance.  
16 It will absorb as much of the fluid  
17 around it as exists, in the sense that at some  
18 point the molecules of that absorptive  
19 substance will essentially disperse their way  
20 throughout the fluid.  
21 So if this fluid, for example, was half a  
22 liter or a liter -- half a liter and I put an  
23 absorptive substance in there, sugar, the  
24 molecules of sugar will be essentially small  
25 compared to the molecules of water in a half

Page 33

1 liter. So a very good approximation of that  
2 would be that there's an infinite amount of  
3 water compared to the small amount of sugar.  
4 If I added more water and more water and  
5 more water, it's still a solution of sugar,  
6 it's just more and more and more and more  
7 dilute.  
8 Q I see. But it's not an infinite capacity,  
9 there are some --  
10 A How deep is the ocean, I guess? I don't mean  
11 to be coy. My point is that there is something  
12 in solution science which says infinite  
13 dilution, which means there is so much more of  
14 the solute, the liquid water in this case,  
15 compared to the solvent -- solute.  
16 There's so much of the solvent, the  
17 water, compared to the solute, the sugar, that,  
18 for all intents and purposes, you can't even  
19 find the sugar.  
20 Q When you started your answer, you actually  
21 carved out cross-linked materials.  
22 A Right.  
23 Q Why did you do that?  
24 A Well, because in cross-linked materials there's  
25 this other restriction, which is the physical

<p style="text-align: right;">Page 34</p> <p>1 network. At some point, even though water can 2 come in and go out because it's not static, 3 it's dynamic, the amount of space between the 4 cross-linked molecules is going to be 5 determined by how heavily connected one 6 molecule is to the other. 7 So if there's a tight network, it will 8 only have this much capacity, a smaller 9 capacity. If it has a loose network, it has a 10 larger capacity. And then of course my 11 extrapolation, if it has no network, it just 12 simply disperses. 13 <b>Q But in the case of Sephadex, for example,</b> 14 <b>that's a cross-linked dextran, correct?</b> 15 A Yes. 16 <b>Q That does have a finite capacity for water?</b> 17 A It would be an example of one that has a finite 18 capacity. 19 <b>Q And then you go on to state that "Its capacity</b> 20 <b>is not controlled by its surface area or pore</b> 21 <b>volume, but rather by the thermodynamics of the</b> 22 <b>interaction of the polymer with the" adsorbed</b> 23 <b>"and dissolved vapor or liquid."</b> 24 <b>What does that mean?</b> 25 MR. SONG: Objection. I</p>	<p style="text-align: right;">Page 36</p> <p>1 interaction with the polymer molecules would be 2 different. 3 So a good solvent, lots of swelling; a 4 poor solvent, hardly any; and an intermediary 5 solvent, of some capacity somewhere in between. 6 <b>Q Well, for example, in Sephadex -- do you know</b> 7 <b>what the mechanism of action is in Sephadex,</b> 8 <b>how that water enters the matrix of the pores?</b> 9 A Well, if you take the Sephadex -- it depends 10 on, again, whether it's on the water vapor or 11 we're talking about liquid water. So you 12 choose and I'll see if I can explain it to you. 13 <b>Q How about water vapor?</b> 14 A Okay. Well, the water vapor molecules are 15 going to approach the Sephadex molecule and 16 penetrate through the surface into the interior 17 and will happen over and over and over again, 18 until eventually the Sephadex becomes 19 essentially what we would call saturated with 20 the water. So it makes its way between 21 molecules into the interior. 22 Certainly there's a physical phenomenon 23 there at the very start, because it's a solid 24 material at the beginning but it's going to be 25 more occurring on the molecular level and</p>
<p style="text-align: right;">Page 35</p> <p>1 think you said "adsorbed" just now and I 2 believe the word is "absorbed." 3 MR. GERGELY: Oh, yeah, yeah, 4 yeah. Thanks for the correction. 5 <b>Q I'm just reading the last sentence of paragraph</b> 6 <b>40.</b> 7 MR. SONG: Not to be 8 nitpicky. 9 <b>Q To be clear, it says "absorbed" with a B.</b> 10 <b>So what did you mean by that last</b> 11 <b>sentence?</b> 12 A Okay. Every time a substance -- well take the 13 cross-linked example that you've centered at. 14 Every liquid or vapor is not like every 15 other in terms of how it interacts with, for 16 example, Sephadex. If it likes water, then the 17 interaction between the water and the 18 polysaccharide that you're talking about is 19 going to allow those molecules to relax more 20 and more and more because there's more places 21 for the water to interact with the molecules. 22 But let's say it's a substance that 23 doesn't like it. So it may and probably does 24 adsorb -- absorb, sorry, absorb less and then 25 just stop, because each solvent in terms of its</p>	<p style="text-align: right;">Page 37</p> <p>1 interacting with the molecules of the Sephadex, 2 not just the pores of the Sephadex. 3 <b>Q How does the water, say an activated carbon,</b> 4 <b>how does it interact with the pores?</b> 5 A Well, because it's an active surface, there's 6 usually some chemistry there which creates a 7 polarity, an attractive electrical force, and 8 then polar molecules, like water, would be 9 easily attracted to the surface. 10 <b>Q So, for example, would that be like a hydroxyl</b> 11 <b>group in the activated carbon interacting with</b> 12 <b>the water?</b> 13 A A hydroxyl group, an oxygen of some chemical 14 functionality could certainly do it. 15 <b>Q Okay. Is that true for other active particles</b> 16 <b>as well, say, for example, silica gel or</b> 17 <b>zeolites?</b> 18 A If they're activated and you're looking to use 19 those in moisture absorption, I would certainly 20 expect the surface to contain some polar 21 molecules, such as an oxygen in some form or 22 another, in some functional group or another 23 that would allow a bond, predominantly I guess 24 by hydrogen bonding. It's a logical way to do 25 it and subtract the water.</p>

<p style="text-align: right;">Page 38</p> <p>1 Q You mentioned hydrogen bonding in active 2 particles. You called out activated carbon, 3 silica gel, and zeolite. 4 Do you know how Sephadex works in terms 5 of the water attaching to the matrix? 6 MR. SONG: I'll object. 7 The witness referred to activated silica gel 8 and zeolites in his prior answer. 9 Q Sir, I had asked you about activated carbon, 10 silica gel, and zeolites, and you postulated 11 that all of those materials contain some sort 12 of polarity in the pores and through hydrogen 13 bonding or some other similar mechanism the 14 water is attaching to those pores. Is that 15 correct? 16 A That's what I said. 17 Q Okay. I'm asking you: Do you know how 18 Sephadex works in terms of how -- what kind of 19 bonding is occurring between the water vapor 20 and the Matrix? 21 A Again, if Sephadex is in fact a 22 polysaccharide-like molecule, it certainly does 23 have functional groups which are both oxygen 24 containing and OH containing. So certainly 25 hydrogen bonding is one of the driving forces</p>	<p style="text-align: right;">Page 40</p> <p>1 Q Is that water being trapped in that matrix? 2 MR. SONG: Objection as to 3 "trap." It's vague. 4 A I would say it is dissolved in rather than 5 trapped in. It's not motionless. 6 Q Why do you say it's dissolved? 7 A Well, because that water molecule may actually 8 be able to move around the various sites and 9 places, because you have a more flexible 10 molecule in there and it's a dynamic process. 11 In hydrogen bonding, for example, in a 12 molecule the size of Sephadex is a dynamic 13 process. It's not just click, click, click, 14 click, click, click. They're all stuck in one 15 stop. They change quite often because of the 16 influx of additional water. 17 Q Now, sir, in paragraph 42 you state, "The 18 processes of absorption and adsorption are 19 fundamentally different." You say, "Absorption 20 can be, in polymer systems, either endo or 21 exothermic." 22 Do you see that? 23 A Yes. 24 Q What do you mean by that? 25 A Well, when you interact at the absorption stage</p>
<p style="text-align: right;">Page 39</p> <p>1 for the absorption of the fluid. 2 Q So the mechanism of action is the same but you 3 characterize it with respect to Sephadex as 4 absorption and not adsorption, is that correct? 5 A Well, the distinction is that while the 6 activated species in an adsorbent process, that 7 would happen at the surface in the pores and 8 not the interior, in the Sephadex it would 9 happen throughout the entirety of the material. 10 So there is a distinction in terms of how 11 many and how much and where and as I said in an 12 earlier section, the end result. 13 Q But Sephadex traps water, correct? 14 A I believe it's safer to say that Sephadex 15 absorbs water. 16 Q Does it also trap it? 17 MR. SONG: Objection, 18 asked and answered. 19 Q Well, for example, when Sephadex takes in 20 water, you could put a bead of Sephadex on the 21 table and it would retain the water within it, 22 correct? 23 A It would -- again, depending upon how much 24 Sephadex relative to the water. It will 25 contain the water.</p>	<p style="text-align: right;">Page 41</p> <p>1 of a polymer with a liquid, you can have a 2 situation where either heat is absorbed or heat 3 is released. 4 Q You say "Adsorption is always exothermic." 5 Do you see that? 6 A Yes. Heat is always released. 7 Q Okay. And then is desorption the opposite of 8 adsorption? 9 A Yes. 10 Q And then is it fair to say if absorption is 11 exothermic, in desorption the process will be 12 endothermic? 13 A What -- I'm going to have to ask you to 14 clarify. 15 Are we talking about something that 16 underwent absorption? 17 Q AD. 18 A AD? 19 Q Yeah. 20 A So something that underwent adsorption and I 21 want to return it to its original state, so I 22 would to desorb? 23 Q Correct. 24 A I have to add heat. So that's a process that 25 requires heat. So it's endothermic.</p>

<p style="text-align: right;">Page 42</p> <p>1 Q Got it. Okay.</p> <p>2 And then you state that "Absorption</p> <p>3 proceeds at a rate that depends upon the</p> <p>4 concentration difference between the vapor</p> <p>5 being absorbed, and the amount already</p> <p>6 absorbed."</p> <p>7 What does that mean?</p> <p>8 A Well, a solution process is driven by the</p> <p>9 concentration difference between the outside</p> <p>10 and the inside of the substance being</p> <p>11 dissolved.</p> <p>12 So when I initially try to dissolve or</p> <p>13 swell a system, the driving force is higher</p> <p>14 because of the bigger difference in</p> <p>15 concentration. And so it starts out quickly</p> <p>16 and it goes slowly until it essentially reaches</p> <p>17 its endpoint. Its equilibrium or endpoint.</p> <p>18 It may never reach an equilibrium point</p> <p>19 as long as there's a concentration gradient</p> <p>20 between what's on the inside and what's on the</p> <p>21 outside.</p> <p>22 A swollen system with these networks, we</p> <p>23 may have a mistaken impression that once it's</p> <p>24 swollen it stops. That's not exactly the case.</p> <p>25 There's an exchange. There still remains a</p>	<p style="text-align: right;">Page 44</p> <p>1 pores, there's no more room.</p> <p>2 Q And then is the substance in that latter case</p> <p>3 said to reach equilibrium?</p> <p>4 A I would call it an equilibrium because it's</p> <p>5 simply reached a state where it has no more</p> <p>6 capacity.</p> <p>7 Q Is that depicted or measured sometimes as the</p> <p>8 adsorption-desorption isotherm?</p> <p>9 A Yes.</p> <p>10 Q There are several classic adsorption-desorption</p> <p>11 isotherms for adsorptive materials, correct?</p> <p>12 A Yes.</p> <p>13 Q Those are known and described in the</p> <p>14 literature?</p> <p>15 A Many are.</p> <p>16 Q You would be familiar with what those look</p> <p>17 like, say a Type I or a Type II or a Type III?</p> <p>18 A Well, yeah. Sometimes they have various</p> <p>19 stages, if you will. Yeah.</p> <p>20 Q Right. Sometimes the curve looks different,</p> <p>21 correct?</p> <p>22 A Yes.</p> <p>23 Q Regardless, those are classic</p> <p>24 adsorption-desorption isotherms for adsorptive</p> <p>25 substances, correct?</p>
<p style="text-align: right;">Page 43</p> <p>1 driving force to take things in. And if it's</p> <p>2 overcapacity, things go out.</p> <p>3 So it's dynamic and you always have this</p> <p>4 free energy difference between the system</p> <p>5 that's got the swollen polymer and the solvent</p> <p>6 on the outside.</p> <p>7 Q And then you state, "Equilibrium is never</p> <p>8 reached, since there always exists a driving</p> <p>9 force for absorption. By contrast, adsorption</p> <p>10 reaches equilibrium."</p> <p>11 Could you explain those two statements?</p> <p>12 A Well, in the case that I just mentioned, the</p> <p>13 absorptive process, we approach equilibrium</p> <p>14 very, very, very slowly but never get there</p> <p>15 because we still have all of this stuff trying</p> <p>16 to figure its way into its final state, if it's</p> <p>17 ever going to get there. Which you still have</p> <p>18 this dynamics going on.</p> <p>19 So at the molecular level, while it may</p> <p>20 seem like there's an equilibrium, as long as</p> <p>21 there's a concentration difference, you're more</p> <p>22 than likely not going to reach an equilibrium</p> <p>23 state.</p> <p>24 In the case of the adsorptive process,</p> <p>25 once you take out all of the areas of the</p>	<p style="text-align: right;">Page 45</p> <p>1 A Correct.</p> <p>2 Q You would know what those look like, correct?</p> <p>3 A I probably would. I haven't studied them in</p> <p>4 quite awhile.</p> <p>5 Q Can you explain what the adsorption-desorption</p> <p>6 isotherm is?</p> <p>7 MR. SONG: I object.</p> <p>8 That's beyond the scope.</p> <p>9 You can go ahead and answer.</p> <p>10 A Well, generally what you're looking at is the</p> <p>11 thermal reaction or process that takes place</p> <p>12 when you reach this approaching equilibrium or</p> <p>13 approaching saturation state. So isotherm</p> <p>14 means constant temperature -- or constant heat.</p> <p>15 Q Is it fair to say that when an adsorptive</p> <p>16 substance reaches equilibrium there's an equal</p> <p>17 amount of material being adsorbed as desorbed?</p> <p>18 MR. SONG: I object.</p> <p>19 That's outside the scope.</p> <p>20 You can answer.</p> <p>21 A Well, are you asking if it's considered dynamic</p> <p>22 at the molecular level? Is that what you're</p> <p>23 saying?</p> <p>24 Q Well, earlier in your testimony you had</p> <p>25 mentioned dynamic. So I'm trying to figure</p>

<p style="text-align: right;">Page 46</p> <p>1 out: When that equilibrium is reached, what's</p> <p>2 happening? Is material being adsorbed and</p> <p>3 desorbed or simply no more material can enter</p> <p>4 the system?</p> <p>5 A Well, the amount of material that can enter the</p> <p>6 system doesn't change. I may exchange partners</p> <p>7 with some other molecule that comes in and</p> <p>8 bumps me out. Okay. If you want to call that</p> <p>9 dynamic at that level, that's fine.</p> <p>10 Q But when an adsorptive material reaches</p> <p>11 equilibrium, what is happening with the system</p> <p>12 in terms of the adsorbate and the solute?</p> <p>13 MR. SONG: I object as to</p> <p>14 the scope, vague as to "what is happening with</p> <p>15 the system."</p> <p>16 You can answer.</p> <p>17 A Well, it depends on, again, the system we're</p> <p>18 talking about. If we're talking about</p> <p>19 something that's free moving because it's not</p> <p>20 crosslinked, then it's going to move around in</p> <p>21 the system until -- until. It's not as a</p> <p>22 result of stirring, it's a result of molecular</p> <p>23 motions that take place as a result of the fact</p> <p>24 that things like Brownian motion take place</p> <p>25 within molecules or among molecules. And so</p>	<p style="text-align: right;">Page 48</p> <p>1 that?</p> <p>2 A If we're looking at weight gain, it's going to</p> <p>3 go like this.</p> <p>4 Q Okay.</p> <p>5 A It's going to approach it slow.</p> <p>6 Q So would the curve be convex?</p> <p>7 A It would be upward. Weight gain.</p> <p>8 Q It would be asymptotic?</p> <p>9 A Yeah.</p> <p>10 Q It would steeply rise and tail off?</p> <p>11 A And tail off.</p> <p>12 Q Okay. Got it.</p> <p>13 In an adsorptive system, what would the</p> <p>14 curve look like?</p> <p>15 A Adsorptive?</p> <p>16 Q With a D.</p> <p>17 A Oh. Okay. You're still going to approach it</p> <p>18 slowly, but how far along you get in terms of</p> <p>19 amount is going to be determined by the surface</p> <p>20 area of the substance. So it's surface area</p> <p>21 limiting -- or pore volume limiting.</p> <p>22 MR. SONG: Do you want to</p> <p>23 take a break? It's five to 10.</p> <p>24 MR. GERGELY: Yeah. Do you</p> <p>25 want to do it now?</p>
<p style="text-align: right;">Page 47</p> <p>1 they move around. They're not sitting in one</p> <p>2 spot. You can't point your finger at a given</p> <p>3 molecule.</p> <p>4 In the case of the swollen system, again,</p> <p>5 if you have a gel that's cross-linked, heavily</p> <p>6 cross-linked, you're still going to have water</p> <p>7 molecules entering in and passing through and</p> <p>8 leaving and exchanging positions with those but</p> <p>9 on a different scale. It's going to be on a</p> <p>10 scale that has to do with the molecules of the</p> <p>11 substance, not the surface area of the</p> <p>12 substance.</p> <p>13 Q So in an absorbing system, is this</p> <p>14 adsorption-desorption equilibrium ever reached?</p> <p>15 A Only when you get to the capacity of the system</p> <p>16 or the -- I've said that backwards.</p> <p>17 Only when the system reaches its capacity</p> <p>18 to hold the fluid. It takes a long time to get</p> <p>19 there. You approach it very slowly. You</p> <p>20 approach it rapidly at first and very slowly</p> <p>21 after that because you still have penetration</p> <p>22 going on and relaxation going on.</p> <p>23 So that's sort of an --</p> <p>24 THE WITNESS: Can I use the</p> <p>25 word "asymptote"? Would you be able to spell</p>	<p style="text-align: right;">Page 49</p> <p>1 MR. SONG: That's fine.</p> <p>2 MR. GERGELY: Let's go off</p> <p>3 the record.</p> <p>4 - - - - -</p> <p>5 (Recess taken.)</p> <p>6 - - - - -</p> <p>7 BY MR. GERGELY:</p> <p>8 Q Sir, can a substance both absorb and adsorb?</p> <p>9 A Depending upon what form it is in, there are</p> <p>10 materials which can be both. If it's</p> <p>11 activated, the driving force mechanism is the</p> <p>12 adsorbent. If it's not, its counterpart would</p> <p>13 be the absorbent.</p> <p>14 Q So can you give me an example of a material</p> <p>15 that would both absorb and adsorb?</p> <p>16 A Well, I'll give you an example of one that</p> <p>17 could be one or the other. A silica gel, for</p> <p>18 example, can be an absorbing substance if it's</p> <p>19 not activated, its surface isn't activated. If</p> <p>20 its surface is activated, then it's more likely</p> <p>21 to be an adsorbent substance.</p> <p>22 MR. GERGELY: Can you mark</p> <p>23 this as Daniels 3.</p> <p>24 - - - - -</p> <p>25 (Petitioner's Exhibit Daniels 3 was marked.)</p>

<p style="text-align: right;">Page 50</p> <p>1 - - - - -</p> <p>2 Q Sir, I've handed you what's been marked as</p> <p>3 Daniels Exhibit 3.</p> <p>4 Is this a document you reviewed in</p> <p>5 connection with your declaration?</p> <p>6 A No. I've not seen this before.</p> <p>7 Q It's a document that's of record in a case that</p> <p>8 was submitted with the petition.</p> <p>9 So you didn't review all of the documents</p> <p>10 that were submitted with Dr. Oelker's</p> <p>11 declaration?</p> <p>12 A I certainly didn't review this one.</p> <p>13 Q Okay. Well, it's a fairly lengthy document, so</p> <p>14 I'm not going to ask you to review the whole</p> <p>15 thing, but I would like to draw your attention</p> <p>16 to page 39.</p> <p>17 A Okay.</p> <p>18 Q Under "Sample composition," it says, "Due to</p> <p>19 the linear partition isotherms, gel filtration</p> <p>20 is remarkably independent of sample</p> <p>21 concentration."</p> <p>22 What does that mean to you with respect</p> <p>23 to Sephadex?</p> <p>24 A I really don't know. I don't, as I say, have a</p> <p>25 lot of familiarity with the document. So I'm</p>	<p style="text-align: right;">Page 52</p> <p>1 things that we are more familiar with is</p> <p>2 effective adsorbing materials are activated in</p> <p>3 one way or another.</p> <p>4 Q When you say "activated," you mean by heat or</p> <p>5 chemistry?</p> <p>6 A Generally those are the two methods.</p> <p>7 Q What about graphite, is that an active</p> <p>8 particle?</p> <p>9 A In its natural form, normally we don't consider</p> <p>10 graphite to be an active material in this. I</p> <p>11 mean it's capable obviously of having high</p> <p>12 surface area, but it's not -- it's not its</p> <p>13 normal utilization.</p> <p>14 Q Do you know whether or not Dr. Haggquist</p> <p>15 disclosed graphite as an active particle in the</p> <p>16 Haggquist patent publication?</p> <p>17 A I don't recall.</p> <p>18 MR. GERGELY: This is also</p> <p>19 preexisting. Can you mark this as Daniels 4.</p> <p>20 - - - - -</p> <p>21 (Petitioner's Exhibit Daniels 4 was marked.)</p> <p>22 - - - - -</p> <p>23 Q Sir, I'm handing you a document. It was</p> <p>24 previously marked as Haggquist Deposition</p> <p>25 Exhibit 6 and we've also put a Daniels Exhibit</p>
<p style="text-align: right;">Page 51</p> <p>1 not exactly sure what's meant by that.</p> <p>2 Q Okay. I understand.</p> <p>3 You didn't review it, so you're not</p> <p>4 familiar with what that would mean?</p> <p>5 A Yeah.</p> <p>6 Q Did you know what a linear partition isotherm</p> <p>7 is?</p> <p>8 A Off the top of my head I don't.</p> <p>9 Q Okay. Let's put this one away, then.</p> <p>10 Sir, on over to 43 in your declaration,</p> <p>11 you continue with the differences between</p> <p>12 adsorption and absorption and you state,</p> <p>13 "Materials such as activated carbon particles</p> <p>14 and porous aluminum oxide can be activated by</p> <p>15 heat and chemical treatment to alter the</p> <p>16 surface chemistry to act as adsorbing species."</p> <p>17 Do you see that?</p> <p>18 A Yes.</p> <p>19 Q Are there some naturally occurring adsorbing</p> <p>20 materials?</p> <p>21 A Naturally occurring adsorbing materials?</p> <p>22 Q Right. That don't have to be activated by heat</p> <p>23 or chemical treatment.</p> <p>24 A I guess it depends on the degree of adsorption.</p> <p>25 I imagine it's possible, but normally the</p>	<p style="text-align: right;">Page 53</p> <p>1 4 sticker on it.</p> <p>2 A Yes.</p> <p>3 Q Is this a document you've reviewed in</p> <p>4 connection with your declaration?</p> <p>5 A Yes.</p> <p>6 Q Sir, drawing your attention to paragraph 4 of</p> <p>7 the document, which is in the specification.</p> <p>8 A Okay.</p> <p>9 Q Do you see where the inventor provides a</p> <p>10 definition of active particles as being "active</p> <p>11 because they have the capacity to adsorb or</p> <p>12 trap substances, including substances that may</p> <p>13 themselves be a solid, liquid, and/or gas"?</p> <p>14 A Could you point me to which paragraph --</p> <p>15 Q Paragraph 4.</p> <p>16 A Oh, 4. I'm sorry.</p> <p>17 Q Yeah. Do you see in paragraph 4 where the</p> <p>18 inventor states "Active particles are active</p> <p>19 because they have the capacity to adsorb or</p> <p>20 trap substances, including substances that may</p> <p>21 themselves be a solid, liquid, and/or a gas"?</p> <p>22 A Yes.</p> <p>23 Q Is that a fair definition of "active</p> <p>24 particles"?</p> <p>25 MR. SONG: I'll object as</p>

<p style="text-align: right;">Page 54</p> <p>1 to use of the term "definition" is vague.</p> <p>2 A Well, certainly they're active, yes.</p> <p>3 Q Do you agree with the inventor's definition</p> <p>4 there?</p> <p>5 MR. SONG: Object as to</p> <p>6 the word "definition." It's vague.</p> <p>7 A I agree that in the context of Dr. Haggquist's</p> <p>8 citing these examples that yes, they're active.</p> <p>9 Q Going on over to paragraph 28.</p> <p>10 A Okay.</p> <p>11 Q Do you see where Dr. Haggquist states "Active</p> <p>12 particles are particles that have pores or</p> <p>13 traps, and have the capacity to adsorb</p> <p>14 substances in solid, liquid, and/or gas phases,</p> <p>15 and combinations thereof."</p> <p>16 Do you see that?</p> <p>17 A I do.</p> <p>18 Q Do you agree with that?</p> <p>19 A Yes.</p> <p>20 Q And then he goes on to state that the "pores</p> <p>21 can vary in size, shape, and quantity,</p> <p>22 depending on the type of active particle."</p> <p>23 Do you see that?</p> <p>24 A Sure.</p> <p>25 Q Do you agree with that?</p>	<p style="text-align: right;">Page 56</p> <p>1 A Yes.</p> <p>2 Q Okay. Do you agree with him that that's</p> <p>3 active?</p> <p>4 A As long as it has the requirements that he</p> <p>5 talks about, which is the presence of these</p> <p>6 pores, it will have some degree of activity.</p> <p>7 Q Okay. What about the pores makes the material</p> <p>8 active?</p> <p>9 A Well, it's simply creating higher surface area.</p> <p>10 Q And then aluminum oxide, activated alumina, are</p> <p>11 you familiar with that substance?</p> <p>12 A Yes.</p> <p>13 Q What is it used for?</p> <p>14 A It's used for fillers. It's used in some cases</p> <p>15 for fire retardants. In other combinations.</p> <p>16 Q Is it used in chromatography?</p> <p>17 A It can be I'm sure if it has porosity. Almost</p> <p>18 anything with pores can be used in</p> <p>19 chromatography.</p> <p>20 Q Is that also true of activated carbon, can it</p> <p>21 be used in chromatography?</p> <p>22 A You can. It's not normally. Well, not of the</p> <p>23 kind of chromatography that we currently --</p> <p>24 they're better materials, let's put it that</p> <p>25 way.</p>
<p style="text-align: right;">Page 55</p> <p>1 A Yes.</p> <p>2 Q Then he states, "For example, some particles</p> <p>3 naturally have pores, such as volcanic rock,</p> <p>4 and other particles such as carbon may be</p> <p>5 treated with extreme temperature and an</p> <p>6 activating agent such as oxygen to create the</p> <p>7 pores."</p> <p>8 Do you see that?</p> <p>9 A Right.</p> <p>10 Q Do you agree with that?</p> <p>11 A Yes.</p> <p>12 Q Okay. There are some active particles which</p> <p>13 naturally occur that do not have to be treated</p> <p>14 with heat or chemistry to be active, correct?</p> <p>15 MR. SONG: I object to</p> <p>16 mischaracterizing the document.</p> <p>17 A Well, obviously because you have pores in a</p> <p>18 naturally occurring material it will have some</p> <p>19 degree of activity. You can't deny that.</p> <p>20 Q And then on over to paragraph 30, do you see</p> <p>21 where Dr. Haggquist lists out some examples of</p> <p>22 active particles?</p> <p>23 A Yes.</p> <p>24 Q Okay. He lists graphite as an active particle.</p> <p>25 Do you see that?</p>	<p style="text-align: right;">Page 57</p> <p>1 Q Okay. But in the past it --</p> <p>2 A It has been. Sure.</p> <p>3 Q And then silica gel.</p> <p>4 A Yes. Yes, I see it.</p> <p>5 Q What is silica gel used for?</p> <p>6 A Well, in common practice silica gel is used as</p> <p>7 a drying agent.</p> <p>8 Q You would consider that an active particle?</p> <p>9 A Well, in the sense that it -- I mean, again, if</p> <p>10 it has a certain amount of surface area, it's</p> <p>11 certainly going to actively function as an</p> <p>12 active -- boy, that's a terrible sentence. It</p> <p>13 will function as an active surface. Active</p> <p>14 material.</p> <p>15 Q How about soda ash, is that also a porous</p> <p>16 material?</p> <p>17 A Normally it is, yes.</p> <p>18 Q You would consider that active?</p> <p>19 A It does have pores and certainly would have</p> <p>20 some degree of activity.</p> <p>21 Q Is that treated with heat or chemistry to</p> <p>22 create those pores?</p> <p>23 A Well, soda ash, any of those products that are</p> <p>24 products of combustion generally are or have</p> <p>25 seen some high temperature exposure. So heat</p>

<p style="text-align: right;">Page 58</p> <p>1 has played a role.</p> <p>2 <b>Q In creating pores?</b></p> <p>3 A Well, certainly in creating the structure that</p> <p>4 creates the active ash particles. Sure.</p> <p>5 <b>Q In the list there is a material which is</b></p> <p>6 <b>parenthesized as cinoxate. I'm not going to</b></p> <p>7 <b>read the entire IUPAC name into the record.</b></p> <p>8 <b>What is cinoxate?</b></p> <p>9 A I believe that's an acronym for the cinnamic</p> <p>10 acid material. It's a powder.</p> <p>11 <b>Q Does it also exist in liquid form?</b></p> <p>12 A I don't recall what the melting point of</p> <p>13 Cinnamic acid is off the top of my head.</p> <p>14 <b>Q And then zeolite, is that the volcanic</b></p> <p>15 <b>material?</b></p> <p>16 A Yes.</p> <p>17 <b>Q That's naturally occurring?</b></p> <p>18 A Sure.</p> <p>19 <b>Q You have to answer "yes" or "no."</b></p> <p>20 A Oh, sorry. Yes.</p> <p>21 <b>Q How about titanium dioxide, is that naturally</b></p> <p>22 <b>occurring?</b></p> <p>23 A It is.</p> <p>24 <b>Q And then molecular filter type materials, what</b></p> <p>25 <b>molecular filter type materials beyond this</b></p>	<p style="text-align: right;">Page 60</p> <p>1 or in a jar that you're trying to dry</p> <p>2 something. What happens is the moisture</p> <p>3 actually penetrates through and on a molecular</p> <p>4 level penetrates the silica gel particle. So</p> <p>5 we classically call silica gel in its most</p> <p>6 ordinary form an absorbing substance.</p> <p>7 <b>Q You say absorbing with a B?</b></p> <p>8 A Absorbing with a B.</p> <p>9 <b>Q But silica gel in its ordinary form is porous,</b></p> <p>10 <b>correct?</b></p> <p>11 A It has pores, sure.</p> <p>12 <b>Q Okay. Is silica gel adsorbing material as</b></p> <p>13 <b>well?</b></p> <p>14 A Well, at the start -- and, again, I think</p> <p>15 anything that has particulate nature, just</p> <p>16 using the diagram here, you're going to see</p> <p>17 adsorption at the surface. I mean it's sort of</p> <p>18 the initial process. Whether it goes into and</p> <p>19 completely penetrates is the distinguishing</p> <p>20 difference between something that's purely</p> <p>21 absorbent from something that's purely</p> <p>22 adsorbent.</p> <p>23 In the case of silica gel, it reaches a</p> <p>24 certain capacity. In some cases they actually</p> <p>25 have colorants in them to indicate that they've</p>
<p style="text-align: right;">Page 59</p> <p>1 list are considered active?</p> <p>2 A In chromatography they use something called</p> <p>3 molecular sieves, and those are used to remove</p> <p>4 impurities from substances, things that are</p> <p>5 colored that you want to get rid of the color</p> <p>6 from. And they consist of a variety of</p> <p>7 materials, all of which I don't recall their</p> <p>8 chemical makeup. But they're widely available.</p> <p>9 <b>Q Is Sephadex a molecular sieve?</b></p> <p>10 A It could be.</p> <p>11 <b>Q Back to your declaration. So we were on</b></p> <p>12 <b>paragraph 43.</b></p> <p>13 In your declaration you said,</p> <p>14 "Contrastingly, an absorbing substance such as</p> <p>15 silica gel or a crosslinked polyacrylic acid</p> <p>16 substance imbibes a liquid such as water,</p> <p>17 causing the particles to swell microscopically</p> <p>18 to macroscopically."</p> <p>19 Do you see that?</p> <p>20 A Yes.</p> <p>21 <b>Q So you characterized silica gel as absorbing.</b></p> <p>22 <b>Why is that?</b></p> <p>23 A Primarily because of the common use of silica</p> <p>24 gel in its ordinary form. The packets of</p> <p>25 drying agent that you get in certain products</p>	<p style="text-align: right;">Page 61</p> <p>1 gotten as much water in them as they can</p> <p>2 possibly hold.</p> <p>3 So it depends on, again, how much of the</p> <p>4 interior volume on a molecular level you're</p> <p>5 going to use as to whether or not you can</p> <p>6 distinguish it from an adsorbent to absorbent</p> <p>7 substance.</p> <p>8 <b>Q So does silica gel in its ordinary form when</b></p> <p>9 <b>it's absorbing water, does it actually swell?</b></p> <p>10 A It can. Most of the time if it's a really</p> <p>11 heavily cross-linked version of it it kind of</p> <p>12 sits there and you attempt not to let it turn</p> <p>13 into a sticky substance. That wouldn't be</p> <p>14 making it a useful material.</p> <p>15 <b>Q Okay. But does it swell on some level?</b></p> <p>16 A It will swell on a molecular level.</p> <p>17 <b>Q Is that why you're saying it's an absorbing</b></p> <p>18 <b>substance?</b></p> <p>19 A Yes.</p> <p>20 <b>Q Have you seen it also characterized as an</b></p> <p>21 <b>adsorbing substance?</b></p> <p>22 A I have seen it characterized that way.</p> <p>23 <b>Q Have you seen Sephadex characterized as both</b></p> <p>24 <b>absorbing and adsorbing?</b></p> <p>25 A I'm not as familiar with Sephadex, so I don't</p>

<p style="text-align: right;">Page 62</p> <p>1 know the answer to that question, whether it's</p> <p>2 been characterized one way or the other. I</p> <p>3 have read people -- I have read articles where</p> <p>4 people call it one or the other, but I'm not as</p> <p>5 completely familiar with it. So, you know, I</p> <p>6 can't answer that question. I just don't know.</p> <p>7 <b>Q In paragraph 44 you state, "As an example, an</b></p> <p>8 <b>adsorptive process can be used to remove water</b></p> <p>9 <b>and organic materials from a vapor stream, and</b></p> <p>10 <b>the active substance can be regenerated in its</b></p> <p>11 <b>original particulate physical form."</b></p> <p>12 <b>Do you see that?</b></p> <p>13 A Yes.</p> <p>14 <b>Q Can you give me an example of that?</b></p> <p>15 A Sure. Activated carbons, for example, can be</p> <p>16 utilized in this adsorptive process and at some</p> <p>17 point be regenerated. In other words, you can</p> <p>18 reheat them and drive off most, if not all, of</p> <p>19 the substance that they've adsorbed and you can</p> <p>20 continue to use them. Or you can repeatedly</p> <p>21 use them.</p> <p>22 <b>Q In contrast, an absorbing substance cannot be</b></p> <p>23 <b>dehydrated?</b></p> <p>24 A Oh, you can dehydrate it, but your likelihood</p> <p>25 in many cases, particularly these hydrophilic</p>	<p style="text-align: right;">Page 64</p> <p>1 will not be capable of regeneration to its</p> <p>2 original physical particulate form without a</p> <p>3 secondary step of size reduction (e.g.</p> <p>4 pulverizing) which has little chance of</p> <p>5 producing its initial particle size and</p> <p>6 particle size distribution."</p> <p>7 A In the most common forms of the absorptive</p> <p>8 materials, that's correct. You end up in a</p> <p>9 state which is physically different from which</p> <p>10 you started.</p> <p>11 <b>Q Okay. How about Sephadex? Do you know if</b></p> <p>12 <b>Sephadex can be regenerated to its original</b></p> <p>13 <b>state?</b></p> <p>14 A I don't know.</p> <p>15 <b>Q Did you investigate that at all in this case?</b></p> <p>16 A No.</p> <p>17 <b>Q If it could be regenerated to its original</b></p> <p>18 <b>state through drying, would that be consistent</b></p> <p>19 <b>with an adsorptive substance?</b></p> <p>20 A Well, it would be consistent with the</p> <p>21 regeneration of an adsorptive substance.</p> <p>22 Again, I don't -- I'm not as familiar with the</p> <p>23 functionality of the Sephadex to know whether</p> <p>24 or not you're actually seeing enough of the</p> <p>25 penetration of the let's say water molecules to</p>
<p style="text-align: right;">Page 63</p> <p>1 materials that are materials that are cited in</p> <p>2 other patents, those things don't easily return</p> <p>3 to their original particulate form.</p> <p>4 They tend to actually begin to flow to</p> <p>5 change their physical form and you have to do</p> <p>6 some other mechanical means to again attempt to</p> <p>7 get them back to their starting point, physical</p> <p>8 form.</p> <p>9 <b>Q You were rubbing your hands together --</b></p> <p>10 A Yes.</p> <p>11 <b>Q -- when you said "mechanical means." I think</b></p> <p>12 <b>in your declaration you referred to</b></p> <p>13 <b>"pulverizing."</b></p> <p>14 A Pulverizing, grinding. Some form of breaking</p> <p>15 them down into a much finer physical shape and</p> <p>16 size.</p> <p>17 <b>Q You wouldn't view that as regeneration,</b></p> <p>18 <b>correct?</b></p> <p>19 A I wouldn't view it as regeneration to the exact</p> <p>20 starting point from which it came. That was</p> <p>21 the contrast I was trying to make.</p> <p>22 <b>Q Okay.</b></p> <p>23 A The sugar example.</p> <p>24 <b>Q So in paragraph 47 of your declaration, on the</b></p> <p>25 <b>next page, you state, "An absorptive material</b></p>	<p style="text-align: right;">Page 65</p> <p>1 the interior to have it meet that threshold of</p> <p>2 behavior as well. It depends on how heavily</p> <p>3 cross-linked it is.</p> <p>4 <b>Q Sir, turning your attention back to Daniels 3</b></p> <p>5 <b>on page 32.</b></p> <p>6 A Okay.</p> <p>7 <b>Q It's actually -- its original page is 32. For</b></p> <p>8 <b>the board's purposes, it's 31 to 57.</b></p> <p>9 A I see that.</p> <p>10 <b>Q The paragraph is titled "Storage and drying of</b></p> <p>11 <b>Sephadex --</b></p> <p>12 A Right.</p> <p>13 <b>Q -- of the G-series."</b></p> <p>14 A Yes.</p> <p>15 <b>Q The author states that "After use, Sephadex can</b></p> <p>16 <b>conveniently be stored in the swollen state</b></p> <p>17 <b>(preferably under refrigeration) after addition</b></p> <p>18 <b>of a bacteriostatic agent." And then they go</b></p> <p>19 <b>on to say, "However, once swollen it can be</b></p> <p>20 <b>dried and restored to its original state by the</b></p> <p>21 <b>following procedure" and then a protocol</b></p> <p>22 <b>follows.</b></p> <p>23 <b>Do you see that?</b></p> <p>24 A I do.</p> <p>25 <b>Q Would that be consistent with regenerating the</b></p>

<p style="text-align: right;">Page 66</p> <p>1     <b>particle to its original state?</b></p> <p>2     A    Again, I haven't actually performed this</p> <p>3         process, so I don't know whether it actually</p> <p>4         gets back to the original state -- I mean</p> <p>5         original and exact state from which it started.</p> <p>6         The implication is that this procedure would</p> <p>7         get you there.</p> <p>8     <b>Q    Okay. Thank you.</b></p> <p>9     A    That's as much as I know.</p> <p>10         Although if you carefully read it, there</p> <p>11         is a piece at the very end. It says, "Clumps</p> <p>12         appearing during this process do not matter, as</p> <p>13         they will disperse during reswelling of the gel</p> <p>14         material."</p> <p>15         And that says somewhat to me that the</p> <p>16         original state, again, has some required</p> <p>17         reduction of the size you get after you remove</p> <p>18         the absorbed, adsorbed, or both material from</p> <p>19         the Sephadex. So while it can be done, it</p> <p>20         isn't an automatic process. You have to do</p> <p>21         something additional. You do produce clusters</p> <p>22         of material that are large.</p> <p>23     <b>Q    Right. And then the author states, "A very</b></p> <p>24         <b>slow shrinking procedure will prevent clump</b></p> <p>25         <b>formation."</b></p>	<p style="text-align: right;">Page 68</p> <p>1     <b>does some sort of stay behind?</b></p> <p>2     A    I've never measured that. So I don't know the</p> <p>3         answer to your question.</p> <p>4     <b>Q    Okay.</b></p> <p>5                 MR. GERGELY:         Can you mark</p> <p>6         that as 5.</p> <p>7                 - - - - -</p> <p>8         (Petitioner's Exhibit Daniels 5 was marked.)</p> <p>9                 - - - - -</p> <p>10         MR. SONG:                 I'll object to</p> <p>11         the exhibit. It's outside the scope and</p> <p>12         outside of the declaration and the witness'</p> <p>13         direct testimony. It's not identified in the</p> <p>14         deposition notice. It has not been</p> <p>15         authenticated under 901 or 902 and lacks</p> <p>16         foundation.</p> <p>17     <b>Q    Dr. Daniels, I've handed you what's been marked</b></p> <p>18         <b>as Daniels Exhibit 5. It's an excerpt from a</b></p> <p>19         <b>textbook entitled "Introduction to Organic</b></p> <p>20         <b>Laboratory Techniques: A Microscale Approach."</b></p> <p>21                 MR. SONG:                 Is there a</p> <p>22         question pending?</p> <p>23                 MR. GERGELY:         I'm leading up</p> <p>24         to it.</p> <p>25     <b>Q    First of all, do you know any of these authors,</b></p>
<p style="text-align: right;">Page 67</p> <p>1                 Do you see that?</p> <p>2     A    Yes, I do see that.</p> <p>3     <b>Q    So they're not pulverizing or mechanically</b></p> <p>4         <b>grinding the material to get it back to its</b></p> <p>5         <b>original state?</b></p> <p>6     A    Not in this. Not in that procedure. That is</p> <p>7         correct.</p> <p>8     <b>Q    And then they're removing the water through</b></p> <p>9         <b>dehydration, correct?</b></p> <p>10    A    Yes.</p> <p>11    <b>Q    That's also true with respect to activated</b></p> <p>12         <b>carbon and silica gel, for example? Those</b></p> <p>13         <b>materials are dehydrated to return them to</b></p> <p>14         <b>their original state, correct?</b></p> <p>15    A    They are.</p> <p>16    <b>Q    For example, silica gel, isn't the most common</b></p> <p>17         <b>dehydration procedure to simply put it in the</b></p> <p>18         <b>microwave oven?</b></p> <p>19    A    Or some oven, yes. Sure.</p> <p>20    <b>Q    And then with other materials are they simply</b></p> <p>21         <b>put into a lab oven?</b></p> <p>22    A    Put them in a lab oven, an air circulating</p> <p>23         oven, a vacuum oven so that you get as complete</p> <p>24         a removal of the material as possible.</p> <p>25    <b>Q    Is all of that water removed in that process or</b></p>	<p style="text-align: right;">Page 69</p> <p>1     <b>these gentlemen; Pavia, Lampman, Kriz, or</b></p> <p>2     <b>Engel?</b></p> <p>3                 MR. SONG:                 I'll object to</p> <p>4         the question as outside the scope. It's not</p> <p>5         cited or referenced in the witness' direct</p> <p>6         testimony. It is not identified in his</p> <p>7         deposition notice. The document has not been</p> <p>8         authenticated to 901 or 902. The document</p> <p>9         lacks foundation and the document constitutes</p> <p>10         hearsay.</p> <p>11                 MR. GERGELY:         Yeah, Counsel,</p> <p>12         you can have a standing objection on those</p> <p>13         lines.</p> <p>14                 MR. SONG:                 Thank you.</p> <p>15     <b>Q    So back to my question.</b></p> <p>16                 Do you know any of these gentlemen?</p> <p>17    A    (Indicating.)</p> <p>18     <b>Q    No, you don't?</b></p> <p>19    A    I don't.</p> <p>20     <b>Q    Sir, drawing your attention to page 698.</b></p> <p>21    A    Okay.</p> <p>22     <b>Q    First of all, this chapter deals with column</b></p> <p>23         <b>chromatography. Do you see that?</b></p> <p>24    A    Yes.</p> <p>25     <b>Q    So on over to 698 -- actually on 697.</b></p>

<p style="text-align: right;">Page 70</p> <p>1 Do you see where on 697 at the bottom</p> <p>2 titled "Interactions" the author talks about</p> <p>3 the different ways that materials were</p> <p>4 adsorbed?</p> <p>5 A Yes.</p> <p>6 Q And then he refers to non-polar compounds. And</p> <p>7 then they state that "The most important</p> <p>8 interactions are those typical of polar organic</p> <p>9 compounds." And then he refers to</p> <p>10 "dipole-dipole type" or some type of direct</p> <p>11 interaction; coordination, hydrogen bonding, or</p> <p>12 salt formation.</p> <p>13 Do you see that?</p> <p>14 A I do.</p> <p>15 Q Are you familiar with those types of forces?</p> <p>16 A Yes.</p> <p>17 MR. SONG: Objection,</p> <p>18 calls for speculation based on the document.</p> <p>19 Q You're familiar with hydrogen bonding, correct?</p> <p>20 A Yes. Yes.</p> <p>21 Q And then on over to 698, do you see the</p> <p>22 call-out which states "The more polar the</p> <p>23 functional group, the stronger the bond to</p> <p>24 alumina (or silica gel)"?</p> <p>25 A I see that call-out.</p>	<p style="text-align: right;">Page 72</p> <p>1 art, do you know what the author's referring to</p> <p>2 here?</p> <p>3 A Yes.</p> <p>4 Q What is he describing?</p> <p>5 A My understanding of this is -- and this is</p> <p>6 fairly well-known and I think I referred to</p> <p>7 this earlier on. The dynamics of an adsorption</p> <p>8 process would be such that -- even on the</p> <p>9 left-hand side where it appears that all of the</p> <p>10 active sites, at least in that field, are</p> <p>11 occupied.</p> <p>12 An RX substance can replace an RX</p> <p>13 substance and interchange with it. It doesn't</p> <p>14 change the capacity of the field surface in the</p> <p>15 box, it just says that every process has some</p> <p>16 degree of dynamic character. One molecule</p> <p>17 bounces into another. Take a snapshot and it</p> <p>18 looks like that. If you wait a few little</p> <p>19 seconds or whatever, you take another snapshot</p> <p>20 and it looks like that.</p> <p>21 Q So the arrows reflecting movement -- first of</p> <p>22 all, RX material is what? Is that a reactive</p> <p>23 material?</p> <p>24 MR. SONG: Objection. It</p> <p>25 calls for speculation.</p>
<p style="text-align: right;">Page 71</p> <p>1 Q Is that how silica gel or alumina is binding</p> <p>2 water, through hydrogen bonding?</p> <p>3 MR. SONG: Objection. It</p> <p>4 calls for speculation to the extent it relies</p> <p>5 on the document.</p> <p>6 A Well, you know, I'm not exactly sure what</p> <p>7 system he's talking about, because obviously I</p> <p>8 haven't read this particular chapter. So I</p> <p>9 don't want to speculate as to what system he's</p> <p>10 specifically referring to in the box there.</p> <p>11 Q Below the box he states at the end of the</p> <p>12 paragraph, "For any adsorbed material, a kind</p> <p>13 of distribution equilibrium can be envisioned</p> <p>14 between the adsorbent material and the solvent.</p> <p>15 This is illustrated Figure 12-2."</p> <p>16 And then 12-2 is on the next page.</p> <p>17 A Okay.</p> <p>18 Q He entitles that "dynamic adsorption</p> <p>19 equilibrium."</p> <p>20 Do you see that?</p> <p>21 A Yes.</p> <p>22 Q Do you know what he's referring to?</p> <p>23 MR. SONG: Objection,</p> <p>24 calls for speculation based on the document.</p> <p>25 Q Sir, as a personal of ordinary skill in the</p>	<p style="text-align: right;">Page 73</p> <p>1 A I don't know what he's referring to in this</p> <p>2 particular substance. What RX is, it obviously</p> <p>3 in some way or another adsorbs to the surface</p> <p>4 of the solid.</p> <p>5 MR. SONG: Can we go off</p> <p>6 the record for one moment?</p> <p>7 MR. GERGELY: Sure.</p> <p>8 - - - - -</p> <p>9 (Discussion held off the record.)</p> <p>10 - - - - -</p> <p>11 A If we're back on the record --</p> <p>12 Q Yeah, we're back on the record.</p> <p>13 A It says "adsorbed molecules." So that's</p> <p>14 obviously what RX is.</p> <p>15 Q Do you understand the arrow moving towards the</p> <p>16 left would reflect adsorption and the arrow</p> <p>17 moving to the right would reflect desorption?</p> <p>18 MR. SONG: Objection. It</p> <p>19 calls for speculation.</p> <p>20 You can answer.</p> <p>21 A Okay. That's the way I would draw it. If I</p> <p>22 were looking at one of the RX molecules moving</p> <p>23 towards the surface, I would follow the arrow</p> <p>24 whose tip is toward the left.</p> <p>25 If I were following the movement of the</p>

<p style="text-align: right;">Page 74</p> <p>1 molecule or substance RX that was coming off 2 and having been replaced, it would follow the 3 arrow to the right. 4 In typical chemistry, when the lengths of 5 the arrows are the same, it means an 6 equilibrium process. That is to say I'm not 7 changing anything on the right or the left 8 every time I take the snapshot. 9 <b>Q That equilibrium is what's graphed as the</b> 10 <b>adsorption-desorption isotherm, correct?</b> 11 MR. SONG: Objection, 12 calls for speculation. 13 A That's where you get to. 14 <b>Q So the answer's yes?</b> 15 A The answer's yes. 16 <b>Q Okay. Thanks.</b> 17 Sir, I would like to draw your attention 18 to page 717, which is -- the section is 12.14 19 "Gel Chromatography." 20 A Okay. I'm there. 21 <b>Q Do you see where the authors state that "The</b> 22 <b>stationary phase in gel chromatography consists</b> 23 <b>of a cross-linked polymeric material.</b> 24 <b>Molecules are separated according to their size</b> 25 <b>by their ability to penetrate a sievelike</b></p>	<p style="text-align: right;">Page 76</p> <p>1 <b>Q Is that consistent with your understanding?</b> 2 MR. SONG: Objection, 3 calls for speculation. 4 A Yes. I believe a Sephadex is a polymeric -- I 5 use the word polysaccharide. Polysaccharides 6 are sugars. Sugars are carbohydrates. We're 7 all saying the same thing. 8 <b>Q And then the authors state, "The degree of</b> 9 <b>cross-linking determines the size of the</b> 10 <b>'holes' in the polymer matrix." They go on to</b> 11 <b>state, "In addition, the hydroxyl groups on the</b> 12 <b>polymer can adsorb water, which causes the</b> 13 <b>material to swell."</b> 14 Do you see that? 15 A I see it. 16 <b>Q You had mentioned earlier in your testimony</b> 17 <b>that you had heard of Sephadex as being</b> 18 <b>described as having the ability to adsorb</b> 19 <b>water, at least in certain references, correct?</b> 20 A Yes. 21 <b>Q Is this such a reference?</b> 22 MR. SONG: Objection, 23 calls for speculation. 24 A It appears to be his understanding of the 25 Sephadex utilization.</p>
<p style="text-align: right;">Page 75</p> <p>1 structure. Molecules permeate the porous 2 stationary phase as they move down the column. 3 Small molecules penetrate the porous structure 4 more easily than large ones"? 5 Do you see that? 6 A Yes. 7 <b>Q Is that a fair description of what Sephadex is</b> 8 <b>doing?</b> 9 MR. SONG: Objection, 10 calls for speculation. 11 A I don't -- I'm having hard time answering that 12 question, simply because I'm not certain what 13 application you're putting this Sephadex in 14 when you ask that question. 15 <b>Q Well, Sephadex is a porous material, correct?</b> 16 A Yes. 17 <b>Q The water either in vapor form or liquid form</b> 18 <b>enters that pore structure, correct?</b> 19 A It can. 20 <b>Q On over to the next page, do you see under the</b> 21 <b>bold title "Sephadex" the author states that</b> 22 <b>"Chemically, Sephadex is a polymeric</b> 23 <b>carbohydrate that has been cross-linked"?</b> 24 Do you understand that? 25 A I do.</p>	<p style="text-align: right;">Page 77</p> <p>1 <b>Q Okay.</b> 2 MR. GERGELY: Let's do 6 and 3 7 at the same time. 4 - - - - - 5 (Petitioner's Exhibit Daniels 6 was marked.) 6 - - - - - 7 (Petitioner's Exhibit Daniels 7 was marked.) 8 - - - - - 9 MR. SONG: I'm going to 10 object to Exhibit 6. It's outside the scope. 11 It's outside of the reference in the witness' 12 direct testimony. It's not identified in the 13 deposition notice. It's not been sufficiently 14 authenticated under 901 or 902. It lacks 15 foundation. It constitutes hearsay and any 16 testimony thereon constitutes speculation. 17 As to exhibit Daniels 6 or exhibit 18 Daniels 7, I object that it is outside the 19 scope and outside of the reference to the 20 witness' direct testimony. It has not been 21 identified in the deposition notice. It has 22 not been sufficiently authenticated under 901 23 or 902. It lacks foundation. It constitutes 24 hearsay and any questions derived or answers 25 derived thereon constitute speculation.</p>

<p style="text-align: right;">Page 78</p> <p>1 Q Sir, I've handed you what's been marked as</p> <p>2 Daniels Exhibit 6 and Exhibit 7.</p> <p>3 MR. GERGELY: Counsel, you</p> <p>4 may have a standing objection with respect to</p> <p>5 this document and we will authenticate it in</p> <p>6 the case.</p> <p>7 MR. SONG: I'm sorry,</p> <p>8 Counsel. You're referencing both documents,</p> <p>9 Daniels 6 and Daniels 7?</p> <p>10 MR. GERGELY: Correct.</p> <p>11 Q So, sir, Daniels 6 is an abstract of a</p> <p>12 publication, Daniels 7 is the publication</p> <p>13 itself. I would like to draw your attention to</p> <p>14 page 59 of the document.</p> <p>15 A Of the document?</p> <p>16 Q Of the Daniels 7, which is the lengthier</p> <p>17 document.</p> <p>18 A 59.</p> <p>19 Q Do you see where the author states that</p> <p>20 "Sephadex G-50 beads are commonly used for</p> <p>21 desalting and gel exclusion chromatography"?</p> <p>22 Do you see that?</p> <p>23 A I see that.</p> <p>24 Q Would you agree it's accurate?</p> <p>25 MR. SONG: Objection,</p>	<p style="text-align: right;">Page 80</p> <p>1 getting close to 11. Do you want to take</p> <p>2 another short break?</p> <p>3 MR. SONG: Sure.</p> <p>4 - - - - -</p> <p>5 (Recess taken.)</p> <p>6 - - - - -</p> <p>7 (Petitioner's Exhibit Daniels 8 was marked.)</p> <p>8 - - - - -</p> <p>9 MR. SONG: I'm going to</p> <p>10 interpose an objection to Daniels 8. It's</p> <p>11 outside the scope. The document is not cited</p> <p>12 or referenced in the witness' direct testimony.</p> <p>13 It's not identified in the deposition notice.</p> <p>14 It has not been authenticated under 901, 902.</p> <p>15 It lacks foundation. It constitutes hearsay.</p> <p>16 Any answers or questions derived from the</p> <p>17 document call for speculation.</p> <p>18 Q Sir, I've handed you what's been marked as</p> <p>19 Daniels 8, which is an article entitled "Water</p> <p>20 Sorption in a Dextran Gel" by Texter,</p> <p>21 Kellerman, and Klier.</p> <p>22 Do you see that?</p> <p>23 A I do.</p> <p>24 Q Do you know any of these gentlemen?</p> <p>25 MR. SONG: Objection.</p>
<p style="text-align: right;">Page 79</p> <p>1 calls for speculation.</p> <p>2 A I think I've said before I'm not entirely</p> <p>3 familiar with the utilization of the Sephadex</p> <p>4 beads or their various parameters. So it would</p> <p>5 be a pure speculation on my part to acknowledge</p> <p>6 that it's a commonly used one. I just simply</p> <p>7 do not know.</p> <p>8 Q And then the authors go on to state, "In</p> <p>9 solution, these beads swell and trap water both</p> <p>10 within the bead, and on the surface of the bead</p> <p>11 in a microfilm, when placed in liquid."</p> <p>12 Do you see that?</p> <p>13 A I see that.</p> <p>14 Q Do you have any reason to doubt the veracity of</p> <p>15 that statement?</p> <p>16 MR. SONG: Objection,</p> <p>17 calls for speculation.</p> <p>18 A I don't have any reason to agree or disagree.</p> <p>19 I've not seen this rather large document, so</p> <p>20 I'm not exactly certainly in what context he's</p> <p>21 asserting the action of the Sephadex beads. So</p> <p>22 it wouldn't be right for me to speculate on how</p> <p>23 it's being used.</p> <p>24 Q All right, sir.</p> <p>25 MR. GERGELY: You know, we're</p>	<p style="text-align: right;">Page 81</p> <p>1 Outside the scope. It's not cited or</p> <p>2 referenced in the witness' direct testimony.</p> <p>3 It's not identified in the deposition notice.</p> <p>4 It has not been authenticated under 901 or 902.</p> <p>5 It lacks foundation. It constitutes hearsay.</p> <p>6 Any testimony derived therefrom calls for</p> <p>7 speculation.</p> <p>8 MR. GERGELY: Counsel, you</p> <p>9 can have the same standing objection.</p> <p>10 MR. SONG: Thank you.</p> <p>11 Q Do you know any of these gentlemen?</p> <p>12 A I do not.</p> <p>13 Q Sir, I'll represent to you that in this paper</p> <p>14 the authors were studying Sephadex.</p> <p>15 Do you see the second line in the</p> <p>16 "abstract" where the authors state that</p> <p>17 "Water-vapor adsorption (desorption) isotherms</p> <p>18 at three temperatures are reported"?</p> <p>19 A I do see that.</p> <p>20 Q So when the adsorption-desorption isotherm is</p> <p>21 reached, is that a state of equilibrium?</p> <p>22 A Basically.</p> <p>23 Q Sir, turning your attention to 192 of the</p> <p>24 document.</p> <p>25 A 192.</p>

<p style="text-align: right;">Page 82</p> <p>1 Q About two-thirds of the way down there's a</p> <p>2 paragraph that starts "We report herein the</p> <p>3 results of near-infrared and water-vapor</p> <p>4 adsorption (desorption) studies on the state of</p> <p>5 adsorbed water in a model carbohydrate system,</p> <p>6 a dextran gel (Sephadex type G-15 gel,</p> <p>7 Pharmacia Fine Chemicals, Inc.)."</p> <p>8 Do you see that?</p> <p>9 A I do.</p> <p>10 Q The authors states that "the swelling molecular</p> <p>11 sieve has found wide usage over the past</p> <p>12 fifteen years in many biochemical purification</p> <p>13 and chromatographic procedures."</p> <p>14 Do you see that?</p> <p>15 A I see that.</p> <p>16 Q Do you have any reason to doubt the veracity of</p> <p>17 those statements?</p> <p>18 MR. SONG: Objection,</p> <p>19 calls for speculation.</p> <p>20 A I'm not familiar with this document at all, so</p> <p>21 I have no reason to either accept it or doubt</p> <p>22 it. I would need to read the entire thing and</p> <p>23 try to understand in what context he's making</p> <p>24 the statements.</p> <p>25 Q Sir, draw your attention to Table 2 on page</p>	<p style="text-align: right;">Page 84</p> <p>1 Figure 6"? And they state further that</p> <p>2 "Extrapolation of the desorption isotherms</p> <p>3 indicates that 5 milligrams of water per gram</p> <p>4 of gel is irreversibly bound to the gel." And</p> <p>5 that "Most of this water is removed, however,</p> <p>6 by the dehydration treatment described in the</p> <p>7 experimental section."</p> <p>8 Do you see that?</p> <p>9 A I do.</p> <p>10 Q Is that consistent with returning the material</p> <p>11 to its original state?</p> <p>12 MR. SONG: Objection. It</p> <p>13 calls for speculation.</p> <p>14 A Well, I would have to read the document again</p> <p>15 completely from start to finish to understand</p> <p>16 what it is they're attempting to show here and</p> <p>17 how they reach that conclusion. I can't by</p> <p>18 just simply looking at the graph understand</p> <p>19 where he gets he masses and all of the other</p> <p>20 explanation that he's presented in that</p> <p>21 paragraph. I just don't know.</p> <p>22 Q But you see Figure 6 where the authors report</p> <p>23 the adsorption-desorption isotherms for water</p> <p>24 on dextran gel --</p> <p>25 A I do.</p>
<p style="text-align: right;">Page 83</p> <p>1 201.</p> <p>2 The authors report "equilibrium amounts</p> <p>3 of adsorbed water and frequencies."</p> <p>4 Do you understand what that means?</p> <p>5 MR. SONG: Objection,</p> <p>6 calls for speculation.</p> <p>7 A Well, I understand the "equilibrium amounts of</p> <p>8 adsorbed water" portion. The rest of it,</p> <p>9 "frequencies" and the like, I'm not at all</p> <p>10 aware of how he's doing this.</p> <p>11 Q So what does "equilibrium amounts of adsorbed</p> <p>12 water" mean to you as a person of ordinary</p> <p>13 skill in the art?</p> <p>14 MR. SONG: Objection, it</p> <p>15 calls for speculation.</p> <p>16 A It means the amount of water that's adsorbed</p> <p>17 when a system reaches equilibrium. I'm just</p> <p>18 deconvoluting his title.</p> <p>19 Q Sir, on over to the next page -- or excuse me,</p> <p>20 to page 203.</p> <p>21 A Yes.</p> <p>22 Q Do you see where the authors report under</p> <p>23 "Isotherms and sorption heats" that "The</p> <p>24 adsorption-desorption isotherms recorded at</p> <p>25 three different temperatures are illustrated in</p>	<p style="text-align: right;">Page 85</p> <p>1 Q -- at various temperatures?</p> <p>2 A I see that.</p> <p>3 Q Those temperatures are reported in Kelvin,</p> <p>4 correct.</p> <p>5 A They are.</p> <p>6 Q In degrees Celsius what is 284 Kelvin?</p> <p>7 A You have to subtract 273 from each of those</p> <p>8 numbers.</p> <p>9 Q Okay. So it would be 15, 26, and 56 Celsius?</p> <p>10 MR. SONG: Would the first</p> <p>11 one be 11?</p> <p>12 A The first one's 11.</p> <p>13 Q Okay. That's why I'm a lawyer.</p> <p>14 So it would be 11 Celsius, 26 Celsius,</p> <p>15 and 56 degrees Celsius?</p> <p>16 A That's right.</p> <p>17 Q The graph that's shown above which reports the</p> <p>18 adsorption-desorption isotherms for water on</p> <p>19 the gel, that's one of the classic</p> <p>20 adsorption-desorption isotherms, correct?</p> <p>21 MR. SONG: Objection,</p> <p>22 calls for speculation.</p> <p>23 A It's what they would look like, sure.</p> <p>24 Q Is that the Type III adsorption-desorption</p> <p>25 isotherm?</p>

<p style="text-align: right;">Page 86</p> <p>1 A I don't remember whether it's Type II or Type 2 III. I would have to go back and look. It's 3 been a long time since I've seen them. 4 Q <b>This graph actually shows that the adsorption 5 starts out slow and then increases in speed, 6 correct?</b> 7 A It does. 8 Q <b>That's consistent with absorption, correct?</b> 9 A Well, absorption can happen at various rates, 10 there's no question about that. Again 11 depending on the surface area of the material 12 we're talking about. 13 Q <b>So earlier in your testimony you mentioned that 14 absorption proceeds asymptotically, correct?</b> 15 A Absorption? 16 Q <b>Absorption with a B.</b> 17 A Yes. Yes. 18 Q <b>So this graph is not such an asymptotic 19 relationship, correct?</b> 20 A No. It would go the other way. It would be -- 21 asymptotic would be it starts out at a rate 22 faster than it approaches equilibrium. So it 23 tails off. 24 Q <b>So an asymptotic relationship is the opposite 25 of what's shown on this graph, correct?</b></p>	<p style="text-align: right;">Page 88</p> <p>1 Q <b>Is that consistent with adsorption?</b> 2 MR. SONG: Objection. It 3 calls for speculation. 4 A I really can't answer it. I don't know how 5 he's measured this, what his sensitivity is. 6 So when I look at those values, I just have no 7 basis by which to judge whether or not that's 8 consistent with adsorption. 9 Q <b>And then below in the -- well regardless, he 10 reports it as a heat of adsorption, correct?</b> 11 A That's how it's reported. 12 Q <b>He reports it as an exothermic process, 13 correct?</b> 14 A Yes. 15 Q <b>Okay. And then below he reports "Desorption 16 heats" and that's the material leaving?</b> 17 A Yes. 18 Q <b>He reports that as endothermic, correct?</b> 19 MR. SONG: Objection. It 20 calls for speculation. 21 A He reports it that way, yes. 22 Q <b>And then below that Figure 8, he actually has 23 text which he refers to the "State of the 24 adsorbed water." 25 Do you see that?</b></p>
<p style="text-align: right;">Page 87</p> <p>1 A Well, see, this isn't -- this isn't time on the 2 axis at the bottom. This is partial pressure. 3 This is concentration. So it's not a time 4 curve. 5 Q <b>So what you were referring to before is a time 6 curve --</b> 7 A Yes. 8 Q <b>-- correct?</b> 9 <b>Regardless, you would agree with me that 10 this is a classic adsorption-desorption model, 11 correct?</b> 12 MR. SONG: Objection, 13 calls for speculation. 14 A Well, as I say, I don't remember which type 15 they are, but it's typically what happens with 16 varying partial pressures of the water in this 17 particular case. 18 Q <b>On over to 204, do you see where the authors 19 depict in Figure 7 the "adsorption heat 20 (exothermic) of water on dextran gel as a 21 function of water coverage"?</b> 22 A Yes. 23 Q <b>They actually refer to that as "The heats of 24 adsorption and desorption" in the text above.</b> 25 A I see that.</p>	<p style="text-align: right;">Page 89</p> <p>1 A I see the text, yes. 2 Q <b>On over to page 206.</b> 3 A Yes. 4 Q <b>Do you see at the top of the document he's 5 proposing a mechanism of action of the adsorbed 6 water molecules participating in two or more 7 hydrogen bonds involving gel hydroxyl groups 8 and/or ether linkages?</b> 9 MR. SONG: Objection. It 10 calls for speculation. 11 A I see he says that. 12 Q <b>That hydrogen bonding mechanism, that's the 13 same hydrogen bonding mechanism that occurs, 14 for example, you mentioned in silica gel?</b> 15 MR. SONG: Objection. It 16 calls for speculation. 17 A If that's the operative mechanism. Most 18 hydrogen bonds are similar to one another. It 19 depends on the substances involved. A hydrogen 20 bond's a hydrogen bond. 21 Q <b>So the answer's yes?</b> 22 A Yes. The answer's yes. 23 Q <b>Now, sir, the prior art that's at issue in this 24 case, you've read that? You read the Dutta and 25 Halley references?</b></p>

<p style="text-align: right;">Page 90</p> <p>1 A Yes.</p> <p>2 Q Do you know Dutta or Halley?</p> <p>3 A Neither one.</p> <p>4 Q Sir, would you agree with me that sometimes in</p> <p>5 scientific articles or publications authors</p> <p>6 sometimes use "absorbing" and "adsorbing"</p> <p>7 interchangeably?</p> <p>8 MR. SONG: Objection,</p> <p>9 vague as to "scientific articles."</p> <p>10 A I would agree that there are people who use</p> <p>11 them sometimes interchangeably and sometimes</p> <p>12 incorrectly.</p> <p>13 Q Now, sir, in paragraph 80 of your declaration.</p> <p>14 A Okay.</p> <p>15 Q So on page 34.</p> <p>16 A I have it.</p> <p>17 Q You state with respect to Dutta that the</p> <p>18 hydrophilic absorptive particles swell to</p> <p>19 several thousand times their own weight with</p> <p>20 water.</p> <p>21 Do you see that?</p> <p>22 A Yes.</p> <p>23 Q Do you know if that's true with respect to</p> <p>24 Sephadex?</p> <p>25 A I don't.</p>	<p style="text-align: right;">Page 92</p> <p>1 Q Is this a copy of the Dutta reference that you</p> <p>2 reviewed?</p> <p>3 A It is.</p> <p>4 Q Do you see anywhere in the reference where he</p> <p>5 soaks the Sephadex material in water or a</p> <p>6 buffer solution prior to mixing them into the</p> <p>7 polyurethane?</p> <p>8 MR. SONG: Counsel, do you</p> <p>9 have a specific passage? Maybe you could point</p> <p>10 it to him.</p> <p>11 Q Well, for example, the Example 1A, which is on</p> <p>12 page 17.</p> <p>13 A 17. Example 1A?</p> <p>14 Q Yeah, Example 1A.</p> <p>15 Well, why don't we do 1B, because I think</p> <p>16 that's the one that's at issue.</p> <p>17 A Okay.</p> <p>18 Q In 1B he doesn't report soaking those particles</p> <p>19 in water or a buffer prior to using them,</p> <p>20 correct?</p> <p>21 A I don't see that he does that, no. Not in 1B.</p> <p>22 Q And then he reports an absorption capacity of</p> <p>23 about 24 grams per gram.</p> <p>24 Do you see that?</p> <p>25 A I see that.</p>
<p style="text-align: right;">Page 91</p> <p>1 Q As applied in Dutta, do you know if that's</p> <p>2 what's actually happening?</p> <p>3 A With respect to Sephadex are you asking or?</p> <p>4 Q Correct.</p> <p>5 A I believe that's what he's implying, yes.</p> <p>6 Q No, I meant in his actual use of Sephadex in</p> <p>7 his material. Is he actually swelling those</p> <p>8 particles to several thousand times their own</p> <p>9 weight?</p> <p>10 A I would have to go back and look at the</p> <p>11 document to be sure.</p> <p>12 Q Well, for example, do you recall if he prior to</p> <p>13 putting those particles into the polyurethane,</p> <p>14 whether he soaked those particles in a buffer</p> <p>15 or water?</p> <p>16 MR. SONG: Objection.</p> <p>17 Counsel, I would ask if you're going to ask him</p> <p>18 about the reference, I would ask that you</p> <p>19 kindly give him a copy of it.</p> <p>20 - - - - -</p> <p>21 (Petitioner's Exhibit Daniels 9 was marked.)</p> <p>22 - - - - -</p> <p>23 Q Sir, I've handed you what's been marked as</p> <p>24 Daniels Exhibit 9.</p> <p>25 A Yes.</p>	<p style="text-align: right;">Page 93</p> <p>1 Q So that's not several thousand times its own</p> <p>2 weight, is it?</p> <p>3 A No.</p> <p>4 Q What is it?</p> <p>5 A Depending on how much he started with, probably</p> <p>6 a gram of material he puts in he's able to</p> <p>7 absorb 24 times as much per gram.</p> <p>8 Q That's capacity, not necessarily what's</p> <p>9 actually happening with the material as it's</p> <p>10 used in this polyurethane, correct?</p> <p>11 A I believe what he's talking about here is that</p> <p>12 Sephadex by itself having that capacity.</p> <p>13 Q It's not actually reported in this document how</p> <p>14 much of the solution is being taken up by</p> <p>15 Sephadex, correct?</p> <p>16 MR. SONG: Objection. The</p> <p>17 document speaks for itself.</p> <p>18 A Well, maybe I'm misunderstanding your question.</p> <p>19 What I read is it has 36 grams of hydrophilic</p> <p>20 urethane solution and one and a half grams of</p> <p>21 dextran. So 1.55 grams of the dextran is added</p> <p>22 to the 36.8.</p> <p>23 Q Right. But it's not reported how much of that</p> <p>24 polyurethane is actually entering into the</p> <p>25 dextran, correct?</p>

<p style="text-align: right;">Page 94</p> <p>1 MR. SONG: Objection. The</p> <p>2 document speaks for itself.</p> <p>3 A How much of the urethane is entering into the</p> <p>4 dextran?</p> <p>5 Q Correct.</p> <p>6 A There's no report of that.</p> <p>7 Q Nor is there any report in this document of how</p> <p>8 much water vapor is entering those particles,</p> <p>9 correct?</p> <p>10 MR. SONG: Objection. The</p> <p>11 document speaks for itself.</p> <p>12 A No. At this point in Example 1B he's really</p> <p>13 just giving you the capacity of the Sephadex.</p> <p>14 He doesn't report how much actually does enter</p> <p>15 it.</p> <p>16 Q So you can't conclude from this document how</p> <p>17 much or to what degree those Sephadex particles</p> <p>18 are swelling, can you?</p> <p>19 A In Example 1B?</p> <p>20 Q Correct.</p> <p>21 A In this paragraph, no, you can't.</p> <p>22 Q Can you anywhere in the document?</p> <p>23 MR. SONG: Objection. The</p> <p>24 document speaks for itself.</p> <p>25 A I don't see -- let me look at this table.</p>	<p style="text-align: right;">Page 96</p> <p>1 - - - - -</p> <p>2 Q Sir, I'm handing you the '287 patent, which was</p> <p>3 previously marked as Haggquist 5 and now we've</p> <p>4 also placed a Daniels 10 sticker on it.</p> <p>5 MR. GERGELY: Counsel, I</p> <p>6 don't have an extra copy with me, so you'll</p> <p>7 have to follow along.</p> <p>8 Q Sir, is this the '287 patent that you reviewed</p> <p>9 in this case?</p> <p>10 A It is.</p> <p>11 Q Now, sir, turning your attention to Figure 2.</p> <p>12 A Yes.</p> <p>13 Q Do you see where the authors present -- well,</p> <p>14 they call it MVTR. Do you understand that as</p> <p>15 meaning MVTR?</p> <p>16 A Yes.</p> <p>17 Q At least with respect to the inverted cup</p> <p>18 method, there are relatively modest increases</p> <p>19 in MVTR?</p> <p>20 A Except when you get to the higher loadings of</p> <p>21 carbon, yes. It depends on what level you're</p> <p>22 talking about.</p> <p>23 Q At least the authors presented the lower</p> <p>24 loading of carbon as being representative of an</p> <p>25 improvement, correct?</p>
<p style="text-align: right;">Page 95</p> <p>1 Well, he reports in Table 1 the -- I</p> <p>2 don't know how much of it he attributes to</p> <p>3 transmission or absorption, but he does say</p> <p>4 that the -- in the case of the Sephadex, the</p> <p>5 test area, 6730 is his value of the water vapor</p> <p>6 transmission.</p> <p>7 Q Okay. But he's not reporting how much water is</p> <p>8 actually being taken in by the Sephadex,</p> <p>9 correct?</p> <p>10 A Not specifically to the Sephadex, no.</p> <p>11 Q You called that the 6730 result for the water</p> <p>12 vapor transmission rate.</p> <p>13 Do you see that versus the control that's</p> <p>14 an improved water vapor transmission rate?</p> <p>15 A It's a little bit, yeah. It's not major.</p> <p>16 Q Okay. It's about 20 percent?</p> <p>17 A That's 12 out of 55. Whatever that works out</p> <p>18 to be. About 20 percent.</p> <p>19 Q Do you know how much improvement was being</p> <p>20 reported in the '287 patent?</p> <p>21 A I don't off the top of my head.</p> <p>22 MR. SONG: Counsel, you</p> <p>23 can have him refer to it if you'd like.</p> <p>24 - - - - -</p> <p>25 (Petitioner's Exhibit Daniels 10 was marked.)</p>	<p style="text-align: right;">Page 97</p> <p>1 A You're talking about example 1 versus a --</p> <p>2 level one versus a control?</p> <p>3 Q Examples 1, 2, and 3.</p> <p>4 A Oh, 1, 2, and 3. Okay.</p> <p>5 Yes, it's an improvement. It's a small</p> <p>6 level, but it's an improvement, yes.</p> <p>7 Q When you really start putting more carbon into</p> <p>8 it, you see more of an improvement, at least</p> <p>9 with respect to the inverted cup method.</p> <p>10 Do you see that?</p> <p>11 A I see that.</p> <p>12 Q Do you know the difference between the inverted</p> <p>13 cup method and the up cup method?</p> <p>14 A I don't recall. Well, I don't want to</p> <p>15 speculate. I remember which way we used to do</p> <p>16 it, but I don't remember whether that's the up</p> <p>17 or the invert. So ...</p> <p>18 Q Do you know what method Dutta was using? Was</p> <p>19 he using the up cup method or the inverted cup</p> <p>20 method?</p> <p>21 MR. SONG: Objection. The</p> <p>22 document speaks for itself.</p> <p>23 A I don't recall which method he was using, the</p> <p>24 up cup or the inverted cup.</p> <p>25 He just said he was using D570, but I</p>

<p style="text-align: right;">Page 98</p> <p>1 don't see it specified as using the up or the</p> <p>2 inverted. On page 15.</p> <p>3 Q Well, do you see, for example, on "Comparative</p> <p>4 Example 2" on page 19 he's referencing "ASTM</p> <p>5 E96-Method B"?</p> <p>6 A This is in Dutta?</p> <p>7 Q Correct.</p> <p>8 A Which paragraph? I'm sorry. Which page?</p> <p>9 Q Well, in --</p> <p>10 A Oh.</p> <p>11 Q In the comparative example he's using ASTM</p> <p>12 E96-Method B.</p> <p>13 A Right.</p> <p>14 Q Do you know what that is?</p> <p>15 A Yes.</p> <p>16 Q Is that an accepted method?</p> <p>17 A It is.</p> <p>18 Q Over on pages 16 and 17, he's discussing his</p> <p>19 testing procedure for WVTR. He doesn't appear</p> <p>20 to call out the specific ASTM test he's using,</p> <p>21 but does that appear to be ASTM 96?</p> <p>22 A I believe that's correct.</p> <p>23 Q Do you see anything in this document indicating</p> <p>24 that he did the incorrect test for WVTR?</p> <p>25 A Well, you can run it a couple of ways, but this</p>	<p style="text-align: right;">Page 100</p> <p>1 A Yes.</p> <p>2 Q First of all, that's your conclusion, correct,</p> <p>3 that's not what Dutta states? Is that right?</p> <p>4 A Right. We have seen references, even as we</p> <p>5 were discussing this morning, where the</p> <p>6 creation of holes as a result of the swelling</p> <p>7 process. That's a scientific principle.</p> <p>8 Q Well, the holes that were referred to in the</p> <p>9 organic chemistry microscale textbook I showed</p> <p>10 you were actually holes in the Sephadex</p> <p>11 particles themselves. They were pores,</p> <p>12 correct?</p> <p>13 A Right. Yes.</p> <p>14 MR. SONG: I'll object as</p> <p>15 being outside the scope in terms of referencing</p> <p>16 the organic chemistry book. The document was</p> <p>17 not cited in the witness' testimony. It was</p> <p>18 not identified in the deposition notice. It</p> <p>19 has not been authenticated. It lacks</p> <p>20 foundation. It constitutes hearsay and calls</p> <p>21 for speculation.</p> <p>22 Q Sir, in paragraph 80, the holes you're</p> <p>23 referring to, are you applying that the</p> <p>24 Sephadex particles are actually tearing holes</p> <p>25 in the membrane?</p>
<p style="text-align: right;">Page 99</p> <p>1 is an accepted method.</p> <p>2 Q Okay. That's all I'm trying to confirm.</p> <p>3 Sir, back to paragraph 80 of your</p> <p>4 declaration. You state that "This swelling --</p> <p>5 or large change in particle size -- is the key</p> <p>6 to how the invention of Dutta works."</p> <p>7 But you'll agree with me Dutta doesn't</p> <p>8 report how much the particles are actually</p> <p>9 swelling, correct?</p> <p>10 MR. SONG: Objection. It</p> <p>11 mischaracterizes the document.</p> <p>12 A It says in the particular passage that I cited</p> <p>13 that it's capable of swelling to a large volume</p> <p>14 several times. Several times to several</p> <p>15 thousand times its own weight.</p> <p>16 Q But, sir, as applied in Dutta, he doesn't</p> <p>17 report how much those particles are actually</p> <p>18 swelling, correct?</p> <p>19 A Not in the table.</p> <p>20 Q And then you go on to state that "A POSITA</p> <p>21 understands that, in Dutta, the hydrophilic</p> <p>22 particles swell and thereby switch the</p> <p>23 membrane, creating holes or channels that allow</p> <p>24 water vapor to move across the membrane."</p> <p>25 Do you see that?</p>	<p style="text-align: right;">Page 101</p> <p>1 A No. The size of the holes in this particular</p> <p>2 case that I'm talking about are not microscopic</p> <p>3 holes, they're channels. They're microscopic</p> <p>4 passages or passageways, not tearing apart the</p> <p>5 membrane.</p> <p>6 Q But that's your conclusion as to the mechanism</p> <p>7 of how Dutta works?</p> <p>8 A Well, it's my conclusion as to how hydrophilic</p> <p>9 particles would work and since Dutta utilizes</p> <p>10 those, that's my conclusion as to how Dutta's</p> <p>11 materials would function.</p> <p>12 Q Okay. So just to be clear, the holes are in</p> <p>13 the particles, not the membrane, correct?</p> <p>14 MR. SONG: Objection,</p> <p>15 vague as to I guess the location or</p> <p>16 configuration of the holes in the question.</p> <p>17 MR. GERGELY: That's what I'm</p> <p>18 trying to clarify with the witness.</p> <p>19 Q You're referring to holes or channels that</p> <p>20 allow water vapor to move across the membrane.</p> <p>21 I want you to be clear for the record.</p> <p>22 Are the holes or channels in the Sephadex</p> <p>23 particles, or are the holes and channels</p> <p>24 actually being created in the membrane?</p> <p>25 A No. The holes and channels that I'm talking</p>

<p style="text-align: right;">Page 102</p> <p>1 about are in the hydrophilic particles within</p> <p>2 the membrane if they're included in the</p> <p>3 membrane.</p> <p>4 <b>Q Okay. Because if there are holes being created</b></p> <p>5 <b>in the membrane, the water vapor transmission</b></p> <p>6 <b>rate would go up extremely high, correct?</b></p> <p>7 A Yes. And you're not relying on that, you're</p> <p>8 relying on the hydrophilic material in my</p> <p>9 explanation of the location of the channels and</p> <p>10 holes.</p> <p>11 <b>Q In your view, how would activated carbon or</b></p> <p>12 <b>silica gel if it was an active particle, how</b></p> <p>13 <b>would that promote water vapor transport across</b></p> <p>14 <b>the membrane?</b></p> <p>15 A Because it serves as a surface capable of</p> <p>16 adsorbing the moisture and enhancing the</p> <p>17 ability of the construction to attract</p> <p>18 moisture.</p> <p>19 <b>Q Isn't that how Sephadex is working too? It's</b></p> <p>20 <b>enhancing the ability of the structure to</b></p> <p>21 <b>attract moisture?</b></p> <p>22 A Yes, but one is by absorption and the other is</p> <p>23 by adsorption. So that result may be that</p> <p>24 you're improving the amount of water that</p> <p>25 moves. Both patents claim the same thing. The</p>	<p style="text-align: right;">Page 104</p> <p>1 <b>from using those particles, correct?</b></p> <p>2 MR. SONG: Objection.</p> <p>3 A Well, I think we're playing with words here.</p> <p>4 We're not -- let me see if I can make a</p> <p>5 distinction.</p> <p>6 Dutta doesn't propose the use of</p> <p>7 nonabsorbent particles for improving water</p> <p>8 vapor transmission. In fact, he doesn't even</p> <p>9 encourage the use of absorbent particles in the</p> <p>10 sense of the '287 patent. He puts in the</p> <p>11 nonabsorbent particles for another reason.</p> <p>12 <b>Q These nonabsorbent particles he states are</b></p> <p>13 <b>inert, correct?</b></p> <p>14 A Inert.</p> <p>15 <b>Q Inert.</b></p> <p>16 <b>You understand inert to mean chemically</b></p> <p>17 <b>inert, correct?</b></p> <p>18 A Physically and chemically inert. They are</p> <p>19 fillers. They take up space.</p> <p>20 <b>Q Activated carbon is inert, correct?</b></p> <p>21 A I'm sorry. You would have to be more specific.</p> <p>22 In what sense?</p> <p>23 <b>Q Well, activated carbon is described, for</b></p> <p>24 <b>example, in MSDS sheets as being inert,</b></p> <p>25 <b>correct?</b></p>
<p style="text-align: right;">Page 103</p> <p>1 question really is what's the underlying</p> <p>2 scientific principle by which that's created.</p> <p>3 That's the distinction I'm trying to make.</p> <p>4 <b>Q Okay. The claims of the '287 patent aren't</b></p> <p>5 <b>limited to a particular scientific principle,</b></p> <p>6 <b>are they?</b></p> <p>7 MR. SONG: Objection,</p> <p>8 vague as to claims, if you're referring to a</p> <p>9 specific claim.</p> <p>10 A It's actually a combination of claims in terms</p> <p>11 of the construction, as well as the active</p> <p>12 materials and their function. So I may not be</p> <p>13 understanding your question.</p> <p>14 <b>Q Yeah. I'll move on.</b></p> <p>15 A Okay.</p> <p>16 <b>Q In paragraph 81, at the end of 81, you said,</b></p> <p>17 <b>"Dutta actively discouraged the use of</b></p> <p>18 <b>nonabsorbent particles for the purpose of</b></p> <p>19 <b>increasing WVTR."</b></p> <p>20 <b>Do you see that?</b></p> <p>21 A Yes.</p> <p>22 <b>Q He actually suggested that these other</b></p> <p>23 <b>particles be included in the film, correct?</b></p> <p>24 A Yes, but for other reasons.</p> <p>25 <b>Q So he's not actively discouraging the reader</b></p>	<p style="text-align: right;">Page 105</p> <p>1 A Chemically.</p> <p>2 MR. SONG: Objection.</p> <p>3 A Chemically inert.</p> <p>4 MR. SONG: Sorry.</p> <p>5 Objection, lacks foundation.</p> <p>6 <b>Q Do you know one way or the other whether Dutta</b></p> <p>7 <b>was referring to these particles as chemically</b></p> <p>8 <b>inert?</b></p> <p>9 MR. SONG: Objection,</p> <p>10 calls for speculation.</p> <p>11 <b>Q Well, I'm asking because you're speculating</b></p> <p>12 <b>that when Dutta meant inert. You're attaching</b></p> <p>13 <b>a particular meaning to it. Does he say what</b></p> <p>14 <b>he means by the word inert?</b></p> <p>15 MR. SONG: Objection.</p> <p>16 Mischaracterizes the witness' testimony. Calls</p> <p>17 for speculation.</p> <p>18 You can answer.</p> <p>19 A I can answer.</p> <p>20 Try one more time with the question.</p> <p>21 <b>Q Dutta doesn't say how these particular</b></p> <p>22 <b>particles are inert, he just describes them as</b></p> <p>23 <b>inert?</b></p> <p>24 A I agree.</p> <p>25 MR. SONG: Objection. The</p>

<p style="text-align: right;">Page 106</p> <p>1 document speaks for itself.</p> <p>2 A I agree. He doesn't -- he doesn't describe the</p> <p>3 nature of inertness, if you will.</p> <p>4 Q And then Haggquist in both the Haggquist</p> <p>5 publication and the '287 patent, he describes</p> <p>6 silica as being an active particle, correct?</p> <p>7 MR. SONG: Objection.</p> <p>8 Mischaracterizes the document referenced.</p> <p>9 Lacks foundation. If counsel would like to</p> <p>10 specifically reference a document, that would</p> <p>11 be acceptable.</p> <p>12 Q Well, silica is -- that's a shorthand for</p> <p>13 silicon dioxide, correct?</p> <p>14 A Yes.</p> <p>15 Q Is it a shorthand for silica gel?</p> <p>16 A It depends on what form it's in. It's</p> <p>17 shorthand for any combination of -- the</p> <p>18 combination of silicon and oxygen. So yes,</p> <p>19 it's an active substance.</p> <p>20 Q And then he also lists carbon black.</p> <p>21 Do you see that?</p> <p>22 A Yes.</p> <p>23 Q And he lists titanium dioxide, correct?</p> <p>24 A Yes.</p> <p>25 Q Titanium dioxide is listed by Haggquist in both</p>	<p style="text-align: right;">Page 108</p> <p>1 A Yes.</p> <p>2 Q What do you mean by that?</p> <p>3 A Well, Dutta doesn't talk about a first and</p> <p>4 second thickness, which is explicitly called</p> <p>5 out in the '287 patent.</p> <p>6 Q Well, Dutta certainly talks about the thickness</p> <p>7 of the film, correct?</p> <p>8 A He talks about the thickness of the film. He</p> <p>9 doesn't talk about them being comprised of two</p> <p>10 distinct or two separately applied thicknesses.</p> <p>11 Q You understand the board has construed first in</p> <p>12 thickness to not necessarily be limited to a</p> <p>13 two layer invention, correct?</p> <p>14 A I understand what the board construed, yes.</p> <p>15 Q So are you saying that the board is wrong?</p> <p>16 A I believe with respect to reading and examining</p> <p>17 the '287 patent that he specifically mentions</p> <p>18 the importance in the construction in a first</p> <p>19 and second layer. First thickness and second</p> <p>20 thickness set of layers.</p> <p>21 Q You're familiar with the file history, and I'll</p> <p>22 get you a copy of it.</p> <p>23 Did you read the entire file history?</p> <p>24 A Not the entire file history.</p> <p>25 Q Did you read portions?</p>
<p style="text-align: right;">Page 107</p> <p>1 his publication and his patent as an active</p> <p>2 particle, correct?</p> <p>3 A I guess my understanding of what Haggquist is</p> <p>4 referring to is either an activated version or</p> <p>5 one which has been proven to be active, yes.</p> <p>6 Q The author of Dutta is not telling the reader</p> <p>7 to avoid these other materials, correct? He's</p> <p>8 actually saying that they can be incorporated</p> <p>9 into the film?</p> <p>10 MR. SONG: Objection.</p> <p>11 Argumentative. Mischaracterizes the document.</p> <p>12 Q He's not telling the reader to avoid these,</p> <p>13 correct?</p> <p>14 MR. SONG: Objection.</p> <p>15 Mischaracterizes the document. Argumentative.</p> <p>16 A He's not telling you to not use them, but he</p> <p>17 certainly is describing when they are used what</p> <p>18 their function would be. So the short answer</p> <p>19 is he's not discouraging their use, he's</p> <p>20 encouraging their use as a filler.</p> <p>21 Q Now, in paragraph 86 you state that "The claims</p> <p>22 are also not anticipated in Ground 1 because</p> <p>23 the Petition does not show how Dutta meets the</p> <p>24 'first thickness' and 'second thickness.'"</p> <p>25 Do you see that?</p>	<p style="text-align: right;">Page 109</p> <p>1 A Yes.</p> <p>2 MR. GERGELY: What did we</p> <p>3 mark the patent as?</p> <p>4 MR. SONG: 10.</p> <p>5 - - - - -</p> <p>6 (Petitioner's Exhibit Daniels 11 was marked.)</p> <p>7 - - - - -</p> <p>8 Q Dr. Daniels, I'm handing you what's been marked</p> <p>9 as Daniels 11, which was previously marked as</p> <p>10 Haggquist 11 as well.</p> <p>11 It's a document entitled "Arguments</p> <p>12 submitted with the filing of a request for</p> <p>13 continued examination."</p> <p>14 Is this a document you reviewed in</p> <p>15 connection with your declaration?</p> <p>16 A I believe I did see this, yes.</p> <p>17 Q This may be the wrong one. Why don't you just</p> <p>18 keep that one in front of you. We'll probably</p> <p>19 get to that later.</p> <p>20 A Okay.</p> <p>21 - - - - -</p> <p>22 (Petitioner's Exhibit Daniels 12 was marked.)</p> <p>23 - - - - -</p> <p>24 Q All right. I've handed you what's been marked</p> <p>25 as Daniels 12, which was previously marked as</p>

<p style="text-align: right;">Page 110</p> <p>1 Haggquist 13.</p> <p>2 A Okay.</p> <p>3 Q Is that a document that you reviewed in</p> <p>4 connection with your declaration?</p> <p>5 A I believe so.</p> <p>6 Q Drawing your attention first to claim 28 on</p> <p>7 page 6.</p> <p>8 Do you see where the inventor's counsel</p> <p>9 amended the claim to state that the</p> <p>10 "liquid-impermeable breathable cured base</p> <p>11 material" comprises a first thickness? Or</p> <p>12 "comprising a first thickness."</p> <p>13 Do you see that?</p> <p>14 A I do.</p> <p>15 Q And then the inventor's counsel also adds in</p> <p>16 with respect to the second element "a plurality</p> <p>17 of active particles in contact with the</p> <p>18 liquid-impermeable breathable cured base</p> <p>19 material, the plurality of active particles</p> <p>20 comprising a second thickness."</p> <p>21 Do you see that?</p> <p>22 A I do.</p> <p>23 Q And then counsel also adds a limitation that</p> <p>24 "the first thickness is less than an order of</p> <p>25 magnitude larger than the second thickness."</p>	<p style="text-align: right;">Page 112</p> <p>1 Q You understand order of magnitude means 10X?</p> <p>2 A 10 times.</p> <p>3 Q Then they go on to state that "Support for</p> <p>4 these claim amendments may be found at, for</p> <p>5 example, Paragraph 49, which states that the</p> <p>6 Example 1 membrane comprise a thickness of</p> <p>7 about 1 mil, or 25.4 microns (the first</p> <p>8 thickness)."</p> <p>9 Do you see that?</p> <p>10 A Yes.</p> <p>11 Q You understand that 1 mil is 25.4 microns?</p> <p>12 A Yes. A thousandth of an inch.</p> <p>13 Q "And paragraph 50, which states that the</p> <p>14 activated carbon used in such a membrane</p> <p>15 comprises Asbury 5564 powdered coconut</p> <p>16 activated carbon."</p> <p>17 Do you see that?</p> <p>18 A I do.</p> <p>19 Q They reference an "attached Product Data Sheet</p> <p>20 for Asbury 5564 powdered coconut activated</p> <p>21 carbon, the particle size for the Asbury 5564</p> <p>22 powdered coconut activated carbon comprises</p> <p>23 about 10 microns (the second thickness)."</p> <p>24 Do you see that?</p> <p>25 A Yes.</p>
<p style="text-align: right;">Page 111</p> <p>1 Do you see that?</p> <p>2 A I do.</p> <p>3 Q Do you understand that the underlined text is</p> <p>4 the amendment that was added?</p> <p>5 A Yes.</p> <p>6 Q Do you see on page 17 where the inventor is</p> <p>7 trying to overcome an obviousness rejection</p> <p>8 over Spijkers and Haggquist's speculation?</p> <p>9 A Yeah, I don't see -- oh, yes, I do see</p> <p>10 Spijkers. Okay. I'm sorry. Yes.</p> <p>11 Q Do you understand that the inventor was making</p> <p>12 these arguments to overcome an obviousness</p> <p>13 rejection?</p> <p>14 A Yes.</p> <p>15 Q The applicant refers to the amended claims,</p> <p>16 including 28. And then he states that the</p> <p>17 "cured base material solution comprises a first</p> <p>18 thickness and the plurality of active particles</p> <p>19 comprises a second thickness."</p> <p>20 Do you see that?</p> <p>21 A Yes.</p> <p>22 Q Then he states that "the first thickness being</p> <p>23 less than an order of magnitude larger than the</p> <p>24 second thickness."</p> <p>25 A Correct.</p>	<p style="text-align: right;">Page 113</p> <p>1 Q Okay. So the inventor and his counsel stated</p> <p>2 that the particle size for Asbury 5564 was</p> <p>3 about 10 microns.</p> <p>4 Do you see that?</p> <p>5 A That's what was stated.</p> <p>6 Q Do you understand that to be the diameter of</p> <p>7 Asbury 5564?</p> <p>8 A I believe that's what was intended here, yes.</p> <p>9 Q And then in parentheses the vendor and his</p> <p>10 counsel states that the particle size comprises</p> <p>11 the second thickness.</p> <p>12 Do you see that?</p> <p>13 MR. SONG: Objection,</p> <p>14 mischaracterizes the document.</p> <p>15 A I believe that's how it could be interpreted,</p> <p>16 yes. Yes.</p> <p>17 Q Okay. And then simple math tells us that the</p> <p>18 second thickness, 10 microns, is less than an</p> <p>19 order of magnitude of the first thickness,</p> <p>20 correct?</p> <p>21 A I'm sorry. Which math are you doing now? The</p> <p>22 10 microns the second thickness is?</p> <p>23 Q Oh. Well, the first thickness is less than an</p> <p>24 order of magnitude larger than the second</p> <p>25 thickness. It's about two and a half times</p>

<p style="text-align: right;">Page 114</p> <p>1 greater, correct?</p> <p>2 A That's what it states, yes.</p> <p>3 Q Ultimately do you understand that the claims</p> <p>4 were amended to have the first thickness at</p> <p>5 least two and a half times greater than the</p> <p>6 second thickness but no greater than an order</p> <p>7 of magnitude thicker? Correct?</p> <p>8 A That's what the '287 patent claims.</p> <p>9 Q So the range is -- or the ratio is about 2.5 to</p> <p>10 10, first thickness to second thickness, right?</p> <p>11 A That's what the patent claims.</p> <p>12 Q So when we refer to this 2.5 to 10 ratio, do</p> <p>13 you understand what I'm saying?</p> <p>14 A Two and a half times to an order of magnitude.</p> <p>15 Right.</p> <p>16 Q So when these activated carbon particles are</p> <p>17 put into a polyurethane solution and made into</p> <p>18 a film, how do they lay down? Do they lay down</p> <p>19 in a perfect monolayer, or do they clump and</p> <p>20 aggregate?</p> <p>21 A Well, my belief is and from what I've observed,</p> <p>22 we'll get to it in a later part of my</p> <p>23 experimental section, I see a cluster of</p> <p>24 particles and I understand it to be a plurality</p> <p>25 or multiplicity of a number of particles.</p>	<p style="text-align: right;">Page 116</p> <p>1 particles is going to be greater than 10</p> <p>2 microns, correct?</p> <p>3 MR. SONG: Objection.</p> <p>4 Incomplete hypothetical. Calls for</p> <p>5 speculation.</p> <p>6 A Well, I think it all depends upon a number of</p> <p>7 factors. One, when somebody says that a</p> <p>8 particle size of a substance is 10 microns,</p> <p>9 that's usually reported as the average, which</p> <p>10 means there are bigger ones and there are</p> <p>11 smaller ones.</p> <p>12 So how they pack when they cluster will</p> <p>13 depend upon a number of things. How it was</p> <p>14 applied, what you started with. It's very</p> <p>15 difficult to -- it would be pure speculation to</p> <p>16 try to estimate what that cluster looks like</p> <p>17 dimensionally.</p> <p>18 Q Well, the inventor and his counsel didn't</p> <p>19 report a range here. He says it comprised</p> <p>20 "about 10 microns."</p> <p>21 Do you see that?</p> <p>22 A I understand that.</p> <p>23 MR. SONG: Objection. It</p> <p>24 mischaracterizes the document. Argumentative.</p> <p>25 Q Well, did he report a range for Asbury 5564?</p>
<p style="text-align: right;">Page 115</p> <p>1 Q So does that make sense to you as a person of</p> <p>2 ordinary skill in the art?</p> <p>3 A Does?</p> <p>4 Q Well, the fact that activated carbon is</p> <p>5 clustering rather than laying down in a</p> <p>6 monolayer.</p> <p>7 A Yes.</p> <p>8 Q Can you estimate what the degree of that</p> <p>9 clustering is? Like, for example, is it --</p> <p>10 what would be -- we know what a monolayer is.</p> <p>11 A monolayer would be a perfect layer of single</p> <p>12 particles?</p> <p>13 A Right.</p> <p>14 Q What would you describe a layer comprised of a</p> <p>15 cluster of particles?</p> <p>16 MR. SONG: Objection,</p> <p>17 calls for speculation.</p> <p>18 A I really don't know. It would depend upon a</p> <p>19 number of factors, the process in particular in</p> <p>20 terms of how many of them pile on top of or</p> <p>21 next to or are associated with. So I really</p> <p>22 don't have a basis for estimating that.</p> <p>23 Q Well, if activated particles are being put into</p> <p>24 a polyurethane solution and they're clustering</p> <p>25 in some form or fashion, the thickness of those</p>	<p style="text-align: right;">Page 117</p> <p>1 A No. What I see is one number.</p> <p>2 Q Okay. Were you able to get a copy of that</p> <p>3 product data sheet?</p> <p>4 A The Asbury 5564?</p> <p>5 Q Right.</p> <p>6 A No. I've not seen it.</p> <p>7 Q I'm asking because in the document they refer</p> <p>8 to an attached product data sheet, but I'll</p> <p>9 represent to you that I've been unable to</p> <p>10 locate that document for whatever reason. It</p> <p>11 appears that it wasn't submitted.</p> <p>12 Have you ever seen a copy?</p> <p>13 A I don't believe I've ever seen a copy.</p> <p>14 Q So let's assume that the inventor's</p> <p>15 characterization is accurate that these</p> <p>16 particulars were 10 microns.</p> <p>17 If they're clustering together, wouldn't</p> <p>18 the thickness of that particle layer be greater</p> <p>19 than 10 microns?</p> <p>20 MR. SONG: Objection.</p> <p>21 Incomplete hypothetical. Calls for</p> <p>22 speculation.</p> <p>23 A Well, it would be a pure guess on my part.</p> <p>24 Q Give me your best judgment, because we know --</p> <p>25 I mean, let me ask you this: To get them to</p>

<p style="text-align: right;">Page 118</p> <p>1 lay down in a perfect monolayer, how difficult</p> <p>2 would that be?</p> <p>3 A Quite.</p> <p>4 Q Would you agree with me that a person of</p> <p>5 ordinary skill in the art would assume that</p> <p>6 these particles are laying down in some sort of</p> <p>7 clustering fashion?</p> <p>8 A I believe that's a realistic model, yes.</p> <p>9 Q If the particles are being laid down in a</p> <p>10 clustering fashion and if they're 10 microns</p> <p>11 each, that particle layer is going to be</p> <p>12 greater than 10 microns. Would you agree with</p> <p>13 me on that?</p> <p>14 MR. SONG: Objection.</p> <p>15 Incomplete hypothetical. Calls for</p> <p>16 speculation.</p> <p>17 A I think the odds are that if one is on top of</p> <p>18 the other, you're going to end up with a</p> <p>19 dimension bigger than 10 microns.</p> <p>20 Q If your first thickness is 25.4 microns and</p> <p>21 your particle is 10 and you got this clustering</p> <p>22 phenomenon going on, which is what's expected</p> <p>23 by a person of ordinary skill in the art, that</p> <p>24 thickness ratio wouldn't be met unless second</p> <p>25 thickness means particle size, correct?</p>	<p style="text-align: right;">Page 120</p> <p>1 size, correct?</p> <p>2 MR. SONG: Objection.</p> <p>3 Calls for a legal conclusion.</p> <p>4 Mischaracterizing as to particle size as</p> <p>5 construed. Incomplete hypothetical. Calls for</p> <p>6 speculation. Lacks foundation.</p> <p>7 Q You can answer.</p> <p>8 A Okay. That conclusion is reached if every</p> <p>9 particle is 10 microns. And I submit to you</p> <p>10 that that is not the case and we have no proof</p> <p>11 of that and I've not measured the particle size</p> <p>12 of this particular substance independently.</p> <p>13 And it would be extraordinarily rare if</p> <p>14 you have a product such as this, all of whose</p> <p>15 particles are 10 microns and no other, none</p> <p>16 larger, none smaller.</p> <p>17 Q Well, here the inventor said that the particle</p> <p>18 size was 10. So let's take them at face value.</p> <p>19 Would you agree with me that if second</p> <p>20 thickness means 10 microns, in the case of this</p> <p>21 example in the patent, that that 2.5 to 10</p> <p>22 ratio would be met, correct?</p> <p>23 MR. SONG: Objection. It</p> <p>24 calls for a legal conclusion. Incomplete</p> <p>25 hypothetical. Lacks foundation.</p>
<p style="text-align: right;">Page 119</p> <p>1 MR. SONG: Objection.</p> <p>2 Incomplete hypothetical. Calls for</p> <p>3 speculation. Vague as to "clustering" and</p> <p>4 vague as to "configuration."</p> <p>5 A All I can tell you is, first of all, I</p> <p>6 understand this was a correction in an</p> <p>7 addendum. So where the 10 micron thing comes</p> <p>8 from, I have no idea.</p> <p>9 But if you take two 10 micron things and</p> <p>10 put them on top of each other, you're going to</p> <p>11 end up with 20 or something slightly less if</p> <p>12 they're tipped. Right? So the ratio would be</p> <p>13 considerably less than the 2.5.</p> <p>14 Q If the definition of second thickness means</p> <p>15 particle size, that ratio would be met,</p> <p>16 correct?</p> <p>17 MR. SONG: Objection.</p> <p>18 Calls for speculation. Vague as to "particle</p> <p>19 size." Lacks foundation.</p> <p>20 Q Well, let me ask you more directly.</p> <p>21 If second thickness means particle size</p> <p>22 and you're dealing with a 10 micron particle</p> <p>23 and you're dealing with a first thickness of</p> <p>24 25.4 microns, the claimed ratio of 2.5 to 10</p> <p>25 will be met if second thickness means particle</p>	<p style="text-align: right;">Page 121</p> <p>1 A Okay. If and only if, okay, if it were 10</p> <p>2 microns, dealing with that number alone, any</p> <p>3 clustering of those particles would obviously</p> <p>4 create a dimension that's thicker than 10</p> <p>5 microns and the ratio wouldn't be met.</p> <p>6 Q If the second thickness means particle size,</p> <p>7 the ratio would be met, correct?</p> <p>8 MR. SONG: Objection.</p> <p>9 Lacks foundation, "the second thickness means</p> <p>10 particle size." Incomplete hypothetical.</p> <p>11 Lacks foundation.</p> <p>12 Q You can answer.</p> <p>13 A Well, again with the provisors if and only if,</p> <p>14 yes.</p> <p>15 MR. GERGELY: Why don't we do</p> <p>16 a break for lunch? So like an hour, is that</p> <p>17 good?</p> <p>18 MR. SONG: Whatever you</p> <p>19 want.</p> <p>20 - - - - -</p> <p>21 (Recess taken.)</p> <p>22 - - - - -</p> <p>23 BY MR. GERGELY:</p> <p>24 Q Sir, back to your declaration, paragraph 95 on</p> <p>25 page 41.</p>

<p style="text-align: right;">Page 122</p> <p>1 A Yes.</p> <p>2 Q You said that you thought Dutta taught away</p> <p>3 from the claimed invention because the film is</p> <p>4 substantially smooth.</p> <p>5 Do you see that?</p> <p>6 A Yes. Yes.</p> <p>7 Q Well, Dutta was just saying that one side is</p> <p>8 substantially smooth, correct?</p> <p>9 MR. SONG: Objection.</p> <p>10 Counsel's testifying.</p> <p>11 A Well, he did say that the -- one of the</p> <p>12 surfaces is substantially smooth. And that is</p> <p>13 different from what you would expect with the</p> <p>14 active particles in the Haggquist invention.</p> <p>15 Q Dutta actually said that those Sephadex</p> <p>16 particles were partially embedded, correct?</p> <p>17 MR. SONG: Objection.</p> <p>18 Mischaracterizes the document. Calls for</p> <p>19 speculation. Please refer to the particular</p> <p>20 document, Counsel.</p> <p>21 A Well, yeah, let's look at that if you have a</p> <p>22 moment here.</p> <p>23 Exhibit 9, right?</p> <p>24 Q Yes.</p> <p>25 A The top of page 11, it says, "In order for the</p>	<p style="text-align: right;">Page 124</p> <p>1 method. And in his words, "a layered</p> <p>2 arrangement of the polymer resin and the</p> <p>3 hydrophilic absorbent particles."</p> <p>4 Q Did you review that passage prior to today?</p> <p>5 A Yes.</p> <p>6 Q Nonetheless, you felt that Dutta taught away</p> <p>7 from a two layer arrangement?</p> <p>8 MR. SONG: Objection. It</p> <p>9 calls for a legal conclusion as to "taught</p> <p>10 away."</p> <p>11 Also I'll object to the extent it's</p> <p>12 inconsistent with the prior line of</p> <p>13 questioning.</p> <p>14 Q Well, sir, as I understand your testimony,</p> <p>15 you're saying you believe Dutta teaches away</p> <p>16 from the combination of Dutta with Haggquist</p> <p>17 because Dutta suggests that the Sephadex</p> <p>18 particles be at least partially embedded and so</p> <p>19 that at least one layer -- excuse me, one</p> <p>20 surface is substantially smooth, correct?</p> <p>21 A Right.</p> <p>22 MR. SONG: Objection. It</p> <p>23 calls for a legal conclusion as to "teaching</p> <p>24 away."</p> <p>25 Q Would you agree with me that the passage we</p>
<p style="text-align: right;">Page 123</p> <p>1 polymer film to be air impermeable, it is</p> <p>2 necessary that hydrophilic absorbent particles</p> <p>3 are at least partially embedded in the polymer</p> <p>4 resin."</p> <p>5 Q Okay. So the inventor's not suggesting to</p> <p>6 totally bury them, he's just saying that they</p> <p>7 have to be at least partially embedded,</p> <p>8 correct?</p> <p>9 A Yeah. And it goes on to say so "at least one</p> <p>10 surface of the film is substantially smooth by</p> <p>11 being free of the particles." Yes.</p> <p>12 Q So that doesn't say that both surfaces have to</p> <p>13 be substantially --</p> <p>14 A No, it doesn't say both surfaces certainly have</p> <p>15 to be.</p> <p>16 Q In terms of exposing the particles, did you</p> <p>17 review Dutta's disclosure of an alternate</p> <p>18 embodiment which has two discrete layers?</p> <p>19 MR. SONG: Objection. It</p> <p>20 calls for speculation. If counsel would like</p> <p>21 to point to a specific passage --</p> <p>22 A Yes, could you --</p> <p>23 Q Page 12, lines 23 through 30.</p> <p>24 A Yeah, he said that that's -- preferred method</p> <p>25 is the blending. There's an alternative</p>	<p style="text-align: right;">Page 125</p> <p>1 just looked at on page 12 would actually</p> <p>2 suggest that the particles can actually be</p> <p>3 layered on top of the polymer resin?</p> <p>4 MR. SONG: Objection. It</p> <p>5 calls for speculation.</p> <p>6 A The wording does indicate that while a</p> <p>7 preferred method is -- called it homogenous.</p> <p>8 There is an example that he cites where you</p> <p>9 could create a useful product where you</p> <p>10 sprinkle active particles on top of the</p> <p>11 resin -- on tope of the film.</p> <p>12 Q In that case the particle would be exposed to</p> <p>13 the air, correct?</p> <p>14 MR. SONG: Objection,</p> <p>15 calls for speculation.</p> <p>16 A Well, I don't know what they would look like,</p> <p>17 but, you know, when he says "distributed over</p> <p>18 the film," again, are we talking about</p> <p>19 uniformly or partially embedded, totally</p> <p>20 embedded? I don't want to read into his</p> <p>21 thoughts.</p> <p>22 Q Okay. You also reviewed the Halley reference,</p> <p>23 correct?</p> <p>24 A Yes.</p> <p>25 MR. SONG: Is this from</p>

<p style="text-align: right;">Page 126</p> <p>1 Haggquist also?</p> <p>2 MR. GERGELY: No.</p> <p>3 Would you mark that as Exhibit 13.</p> <p>4 - - - - -</p> <p>5 (Petitioner's Exhibit Daniels 13 was marked.)</p> <p>6 - - - - -</p> <p>7 Q Sir, I've handed you what's marked as Daniels</p> <p>8 13.</p> <p>9 Is this the Halley reference you reviewed</p> <p>10 in connection with your declaration?</p> <p>11 A I believe it is, yes.</p> <p>12 Q In paragraph 98 you state that you believe that</p> <p>13 "Halley does not disclose 'active particles,'</p> <p>14 'first thickness,' and 'second thickness.'"</p> <p>15 Is that right?</p> <p>16 A Correct.</p> <p>17 Q We can get to active particles later, but is</p> <p>18 your issue with first thickness and second</p> <p>19 thickness the same analysis as your analysis of</p> <p>20 Dutta, that these materials are mixed together</p> <p>21 rather than forming discrete layers?</p> <p>22 MR. SONG: Objection. It</p> <p>23 mischaracterizes the witness' testimony. Vague</p> <p>24 and ambiguous as to the word "issue."</p> <p>25 A My belief is that Halley doesn't rely on the</p>	<p style="text-align: right;">Page 128</p> <p>1 Q So if the board's construction is correct,</p> <p>2 would Dutta and Halley both show a first and</p> <p>3 second thickness?</p> <p>4 MR. SONG: Objection. It</p> <p>5 lacks foundation. Incomplete hypothetical.</p> <p>6 Calls for speculation.</p> <p>7 A I'm a little confused. Are you asking me if</p> <p>8 the board interprets, let's say, Halley's</p> <p>9 patent as citing to --</p> <p>10 Q No. No. No.</p> <p>11 A -- or is it --</p> <p>12 Q Well, the board has a claim construction which</p> <p>13 you're taking issue with, correct?</p> <p>14 A Correct.</p> <p>15 Q If the board's construction is correct, would</p> <p>16 Dutta show first and second thickness?</p> <p>17 MR. SONG: Objection.</p> <p>18 Incomplete hypothetical. Calls for</p> <p>19 speculation. Lacks foundation.</p> <p>20 A I'm not certain how we get there. Are you</p> <p>21 talking about with respect to the what I'm</p> <p>22 going to call a nonpreferred construction that</p> <p>23 we just discussed in Dutta?</p> <p>24 Q No. The preferred one.</p> <p>25 A The preferred one.</p>
<p style="text-align: right;">Page 127</p> <p>1 presence of a first and second thickness.</p> <p>2 Q Okay. Is that based on what you believe to be</p> <p>3 the correct claim construction?</p> <p>4 A Yes.</p> <p>5 Q You understand that the board has taken the</p> <p>6 position that first and second thickness do not</p> <p>7 necessarily mean two discrete layers? You</p> <p>8 understand that, correct?</p> <p>9 A With respect to the Haggquist patent?</p> <p>10 Q Correct.</p> <p>11 MR. SONG: Objection.</p> <p>12 Sorry a little late. Calls for a legal</p> <p>13 conclusion as to "claim construction." It</p> <p>14 mischaracterizes "first thickness" and "second</p> <p>15 thickness." It lacks foundation.</p> <p>16 A Well, as I said, I understand what the board</p> <p>17 interpreted, but my reading of this patent, he</p> <p>18 being Dr. Haggquist, is that he finds that to</p> <p>19 be an important and functional structure in the</p> <p>20 product that he's describing in his invention.</p> <p>21 So briefly said, the board has their</p> <p>22 opinion and I have mine when I read this</p> <p>23 patent.</p> <p>24 Q Okay.</p> <p>25 A And that's what I've expressed.</p>	<p style="text-align: right;">Page 129</p> <p>1 Q Yeah.</p> <p>2 A It's not clear to me how we would interpret</p> <p>3 that as being a two layer.</p> <p>4 Q Right. I'm asking you. The board has</p> <p>5 construed the first thickness as possibly</p> <p>6 including the active particles. So if the</p> <p>7 board's construction is correct, would Dutta</p> <p>8 show that first thickness and second thickness?</p> <p>9 MR. SONG: Objection.</p> <p>10 Incomplete hypothetical. Lacks foundation.</p> <p>11 Calls for a legal conclusion as to</p> <p>12 "construction."</p> <p>13 A I have a difficult time with that, simply</p> <p>14 because the foundation for the claims in the</p> <p>15 Haggquist patent clearly show a two-step</p> <p>16 process by which he constructs his workable</p> <p>17 examples. Unfortunately I'm biased by what I</p> <p>18 saw under the microscope as well. We'll leave</p> <p>19 that alone for a moment. We'll get there.</p> <p>20 Q Yeah. Well, those aren't in the patent. Those</p> <p>21 are --</p> <p>22 A I understand.</p> <p>23 Q Those are commercial embodiments.</p> <p>24 A I understand. I understand. So we'll just set</p> <p>25 that aside.</p>

<p style="text-align: right;">Page 130</p> <p>1 I can't get to a two layer construction</p> <p>2 per your question if the board is correct. I</p> <p>3 mean a two component construction, I'm okay</p> <p>4 with those words. Two layer, I don't see how</p> <p>5 you get there.</p> <p>6 Q Well, I think the way the board is getting</p> <p>7 there and what Dr. Haggquist and his attorney</p> <p>8 told the PTO was that the second thickness was</p> <p>9 based on particle size. If that logic holds,</p> <p>10 would there be a first and second thickness</p> <p>11 disclosed by both Dutta and Halley?</p> <p>12 MR. SONG: Objection.</p> <p>13 Asked and answered. Incomplete hypothetical.</p> <p>14 Lacks foundation. Calls for speculation.</p> <p>15 A I guess my answer still remains the same. I</p> <p>16 don't see how you can get there based on the</p> <p>17 claim constructions of either Halley or Dutta</p> <p>18 compared to the claim construction in</p> <p>19 Haggquist. It seems to be pretty explicit in</p> <p>20 Haggquist what he's trying to do, what he's</p> <p>21 accomplished.</p> <p>22 So I don't -- I think the attempt on the</p> <p>23 part of the board is to misconstrue what</p> <p>24 Haggquist said, or misinterpret it at least.</p> <p>25 And, you know, if that's allowed then, well,</p>	<p style="text-align: right;">Page 132</p> <p>1 Q So Halley states that "A preferred particulate</p> <p>2 solid is carbon particles. Other particulate</p> <p>3 solids include inorganic particulate materials,</p> <p>4 pigments, metal oxides, metal salts or metal</p> <p>5 particles. Further particulate solids include</p> <p>6 particles of titanium dioxide, zinc oxide, iron</p> <p>7 oxide, aluminum oxide, silica, talc, mica, tin</p> <p>8 or silver."</p> <p>9 Do you see that?</p> <p>10 A I do.</p> <p>11 Q Titanium dioxide is one of the particles that</p> <p>12 Dr. Haggquist disclosed as an active particle,</p> <p>13 correct?</p> <p>14 MR. SONG: Objection. It</p> <p>15 mischaracterizes the document referenced.</p> <p>16 Calls for speculation.</p> <p>17 A Titanium dioxide was called out as an example</p> <p>18 in the Haggquist patent. And my interpretation</p> <p>19 of it and I think the intended interpretation</p> <p>20 of it was that it was a high enough surface</p> <p>21 area material to be considered an active</p> <p>22 particle.</p> <p>23 What I looked for and didn't find in</p> <p>24 Dutta or in Halley -- let's talk about Halley.</p> <p>25 Let's stick with that for the moment -- is any</p>
<p style="text-align: right;">Page 131</p> <p>1 there you have it, but I don't agree.</p> <p>2 Q Okay. With respect to active particles, Halley</p> <p>3 does disclose admittedly some active particles,</p> <p>4 correct?</p> <p>5 MR. SONG: Objection.</p> <p>6 Vague as to "active particles." It</p> <p>7 mischaracterizes the document.</p> <p>8 Counsel, if there's a specific passage, a</p> <p>9 reference, that would be appreciated.</p> <p>10 Q Well, I understand you're contesting that</p> <p>11 carbon black is active, correct?</p> <p>12 A My contesting is this way. It's an important</p> <p>13 distinction to talk about the degree of</p> <p>14 activity. And I think I made the point in my</p> <p>15 declaration.</p> <p>16 There's a distinct scientific,</p> <p>17 commercial, and functional difference between</p> <p>18 an activated carbon particle on it's literally</p> <p>19 activated, versus one that has a high surface</p> <p>20 area and can be interpreted or construed as</p> <p>21 being active. They're not interchangeable and</p> <p>22 never should be.</p> <p>23 Q Well, let's take a look at the list in Halley</p> <p>24 on page 3.</p> <p>25 A Page 3. Okay.</p>	<p style="text-align: right;">Page 133</p> <p>1 reference in this that calls out the importance</p> <p>2 of an active -- by name active material, a so</p> <p>3 labeled active material. I mean, we can agree</p> <p>4 that some of these materials can be active, but</p> <p>5 the functionality of activity in my reading of</p> <p>6 this document is not specified.</p> <p>7 Q Well, if Haggquist says titanium dioxide is</p> <p>8 active and that was known in the art, according</p> <p>9 to his patent publication, by definition isn't</p> <p>10 titanium dioxide an active particle for</p> <p>11 purposes of this analysis?</p> <p>12 MR. SONG: Objection. It</p> <p>13 mischaracterizes the document referenced. If</p> <p>14 counsel would like to refer to the Haggquist</p> <p>15 application for the specific language, that</p> <p>16 would be acceptable, otherwise it calls for</p> <p>17 specification.</p> <p>18 Q Well, we've been through the list in Haggquist</p> <p>19 and he lists titanium dioxide as an active</p> <p>20 particle, correct?</p> <p>21 A Yes, he does.</p> <p>22 If Halley had specifically stated that</p> <p>23 these were active particles and the active</p> <p>24 particle portion of his invention was critical</p> <p>25 to its function, that would be one conclusion</p>

<p style="text-align: right;">Page 134</p> <p>1 you would directly come to.</p> <p>2 But simply saying because I can have</p> <p>3 titanium dioxide in my composition of my</p> <p>4 material doesn't necessarily mean I've included</p> <p>5 it, because its intention is to be an active</p> <p>6 particle contributor to the functionality of</p> <p>7 the material.</p> <p>8 There's titanium dioxide in your</p> <p>9 toothpaste and in your vinyl siding. It's not</p> <p>10 there because it's an active particle. It's an</p> <p>11 active particle by definition because it has a</p> <p>12 measurable surface area, but its function is</p> <p>13 totally different.</p> <p>14 Q Well, you're talking about purpose versus</p> <p>15 properties, correct?</p> <p>16 A I am.</p> <p>17 Q Okay.</p> <p>18 A I am.</p> <p>19 Q I'm talking about properties. Because we can</p> <p>20 equivocate about intent and purpose all day</p> <p>21 long, but the properties would be active,</p> <p>22 correct?</p> <p>23 A I understand that. I cannot and will not</p> <p>24 speculate on what Halley's intention was for</p> <p>25 utilization of titanium dioxide or any of these</p>	<p style="text-align: right;">Page 136</p> <p>1 Q Okay. Now let's talk about Black Pearls 2000,</p> <p>2 which is the specific particle that Halley</p> <p>3 used.</p> <p>4 Would you agree with me that Black Pearls</p> <p>5 2000 has a high surface area?</p> <p>6 A You know, I've never seen a specification sheet</p> <p>7 for Black Pearls 2000, so I really can't answer</p> <p>8 your question.</p> <p>9 Q Would you agree with me that Black Pearls 2000</p> <p>10 has been described in the literature as</p> <p>11 adsorbing water?</p> <p>12 MR. SONG: Objection.</p> <p>13 Vague as to "the literature." Calls for</p> <p>14 speculation. Lacks foundation.</p> <p>15 A I've not and I don't recall the direct</p> <p>16 reference between -- that you're citing that</p> <p>17 stipulates that Black Pearls 2000 absorbs or</p> <p>18 adsorbs water. I've not seen that</p> <p>19 specifically, so I can't speculate.</p> <p>20 Q Did you review the Wang reference that</p> <p>21 Dr. Oelker cited with her petition -- with her</p> <p>22 declaration?</p> <p>23 A No. Specifically I did not with the Wang</p> <p>24 reference.</p> <p>25 Q Do you know what I mean by "pore volume"?</p>
<p style="text-align: right;">Page 135</p> <p>1 others unless he specifically tells me that it</p> <p>2 was there for this purpose or that purpose.</p> <p>3 Because it's there doesn't necessarily -- isn't</p> <p>4 necessary for me or a requirement for me to</p> <p>5 assume it's there because it's an active</p> <p>6 particle. I think that's calling for an</p> <p>7 assumption on my part quite frankly I'm not</p> <p>8 capable of making.</p> <p>9 Q Irrespective of purpose, would you agree that</p> <p>10 titanium dioxide is an active particle as</p> <p>11 defined by Haggquist?</p> <p>12 MR. SONG: Objection.</p> <p>13 Lacks foundation. Mischaracterizes the</p> <p>14 document. Calls for speculation.</p> <p>15 Q In terms of its properties.</p> <p>16 A It is among that list of materials that</p> <p>17 Haggquist cites as active particles. So we can</p> <p>18 make the assumption that that's how he was</p> <p>19 describing it in that list of active materials.</p> <p>20 Q Is the same true with respect to the zinc</p> <p>21 oxide, aluminum oxide, silica?</p> <p>22 A Well, I have to go back and look at Haggquist,</p> <p>23 but if they're cited in Haggquist as active</p> <p>24 particles, they're there for a reason because</p> <p>25 they're active particles.</p>	<p style="text-align: right;">Page 137</p> <p>1 A Yes.</p> <p>2 Q What's the metric for expressing pore volume?</p> <p>3 A Usually in volume units per gram of material.</p> <p>4 Q Like a cubic centimeter per gram?</p> <p>5 A Something like that is fine.</p> <p>6 Q Okay. Or maybe -- yeah.</p> <p>7 A Yeah.</p> <p>8 Q Do you know what the pore volume is for</p> <p>9 activated carbon?</p> <p>10 A I've only seen approximations of those and they</p> <p>11 can range all the way up to, as I said earlier</p> <p>12 this morning, to several thousand square feet.</p> <p>13 That's a terrible measure.</p> <p>14 Q Well, that's surface area though, right?</p> <p>15 A I'm sorry. Surface area. Pore volume -- pore</p> <p>16 volume is what you're asking about?</p> <p>17 Q Yeah. Pore volume's different.</p> <p>18 A Sorry.</p> <p>19 Q That's three-dimensional?</p> <p>20 A No. No. I don't know off the top of my head</p> <p>21 know the typical pore volume of an activated</p> <p>22 carbon. I wouldn't want to be guessing.</p> <p>23 Q Okay. With respect to surface area, have you</p> <p>24 ever reviewed Dr. Haggquist's declaration from</p> <p>25 the file history where he states that active</p>

<p style="text-align: right;">Page 138</p> <p>1 particles have a surface area of up to 1,000</p> <p>2 meters square per gram?</p> <p>3 MR. SONG: Objection.</p> <p>4 Mischaracterizes the document. Calls for</p> <p>5 speculation. Lacks foundation.</p> <p>6 Q Let's take a look at that.</p> <p>7 A Is that one we've already examined?</p> <p>8 Q I don't know that we have.</p> <p>9 - - - - -</p> <p>10 (Petitioner's Exhibit Daniels 14 was marked.)</p> <p>11 - - - - -</p> <p>12 Q I've handed you what's been marked as Daniels</p> <p>13 Exhibit 14. It was previously marked as</p> <p>14 Haggquist Deposition Exhibit 7.</p> <p>15 A Okay.</p> <p>16 MR. SONG: Is that one of</p> <p>17 the petitioner's exhibits?</p> <p>18 THE WITNESS: Yes.</p> <p>19 MR. GERGELY: No, it was not.</p> <p>20 This was introduced during Dr. Haggquist's</p> <p>21 deposition.</p> <p>22 MR. SONG: I'll just</p> <p>23 object as to scope. The witness has not cited</p> <p>24 or referenced the document in his direct</p> <p>25 testimony, the document has not been identified</p>	<p style="text-align: right;">Page 140</p> <p>1 statements?</p> <p>2 MR. SONG: Objection to</p> <p>3 the extent that it is incomplete and that there</p> <p>4 are two sentences remaining in that paragraph</p> <p>5 and that paragraph constitutes a complete</p> <p>6 statement.</p> <p>7 A Well, I've read what has been written so far</p> <p>8 and so far we're okay.</p> <p>9 Q Okay. You threw out a number before. You said</p> <p>10 something like several thousand.</p> <p>11 A Square feet.</p> <p>12 Q So you're referring to square feet?</p> <p>13 A Square feet.</p> <p>14 Q Which is different from meters squared?</p> <p>15 A Different from meters squared, yeah. Remember</p> <p>16 meter is approximately 3 and a fraction feet.</p> <p>17 Q Got it.</p> <p>18 In paragraph 7, Dr. Haggquist goes on to</p> <p>19 say that "The term 'active particle' is used</p> <p>20 throughout the industry to refer to all or any</p> <p>21 type of active particles comprising an organic</p> <p>22 or inorganic material which has the capacity to</p> <p>23 adsorb or trap substances."</p> <p>24 Do you see that?</p> <p>25 A I do.</p>
<p style="text-align: right;">Page 139</p> <p>1 in the deposition notice. It lacks</p> <p>2 authentication. It lacks foundation. It</p> <p>3 constitutes hearsay. It potentially calls for</p> <p>4 speculation. The witness has not had an</p> <p>5 opportunity to read the document.</p> <p>6 Q Sir, I'll represent to you that this</p> <p>7 declaration was from the file history of the</p> <p>8 '287 patent.</p> <p>9 MR. SONG: Sorry to</p> <p>10 interrupt. Peter, may I have the same standing</p> <p>11 objection?</p> <p>12 MR. GERGELY: Yes, of course.</p> <p>13 Q Sir, drawing your attention to paragraph 6 of</p> <p>14 Dr. Haggquist's declaration.</p> <p>15 A Okay.</p> <p>16 Q He says, "An active particle is an organic or</p> <p>17 inorganic material that has the capacity to</p> <p>18 adsorb or trap substances, including substances</p> <p>19 that may be a liquid and/or gas. It is the</p> <p>20 complex surface of the particles, sometimes on</p> <p>21 the order of 1,000 meters square per gram in</p> <p>22 surface area, that give the active particles</p> <p>23 their capacity to adsorb."</p> <p>24 A Okay.</p> <p>25 Q Would you agree that those are accurate</p>	<p style="text-align: right;">Page 141</p> <p>1 Q Do you agree with the accuracy of that</p> <p>2 statement?</p> <p>3 A I think that's fine.</p> <p>4 Q And then he goes on to state, "As all organic</p> <p>5 or inorganic active particle materials operate</p> <p>6 similarly by trapping substances in an active</p> <p>7 particle surface, it is known in the art that</p> <p>8 an active particle used in an example process</p> <p>9 or mixture may be replaced by any other active</p> <p>10 particle to obtain a substantially similar</p> <p>11 result."</p> <p>12 Do you see that?</p> <p>13 A I see that.</p> <p>14 Q Do you agree with the accuracy of that</p> <p>15 statement?</p> <p>16 A I think that's a practice that's been done,</p> <p>17 yes.</p> <p>18 MR. GERGELY: Can we mark</p> <p>19 this one as 15.</p> <p>20 - - - - -</p> <p>21 (Petitioner's Exhibit Daniels 15 was marked.)</p> <p>22 - - - - -</p> <p>23 MR. GERGELY: This one as 16.</p> <p>24 - - - - -</p> <p>25 (Petitioner's Exhibit Daniels 16 was marked.)</p>

<p style="text-align: right;">Page 142</p> <p>1 - - - - -</p> <p>2 Q Dr. Daniels, I'm handing you what's been</p> <p>3 previously marked as Haggquist 8 and 9 and</p> <p>4 we've marked the Daniels 15 and 16, which are</p> <p>5 two articles by Wang.</p> <p>6 MR. SONG: Are both of</p> <p>7 those exhibits petitioner's exhibits?</p> <p>8 MR. GERGELY: The first one</p> <p>9 is.</p> <p>10 MR. SONG: Which one is</p> <p>11 the first one?</p> <p>12 MR. GERGELY: The first one</p> <p>13 is --</p> <p>14 MR. SONG: Daniels 15?</p> <p>15 MR. GERGELY: VF Exhibit</p> <p>16 1028, which is really Daniels 15.</p> <p>17 MR. SONG: So I'm going to</p> <p>18 object to Daniels 16. It's outside the scope.</p> <p>19 It's not cited or referenced in the witness'</p> <p>20 direct testimony. It is not identified in the</p> <p>21 deposition notice. It constitutes hearsay. It</p> <p>22 has not been authenticated under 901 or 902.</p> <p>23 It lacks foundation. It calls for speculation</p> <p>24 to the extent he answers questions based on</p> <p>25 Exhibit Daniels 16.</p>	<p style="text-align: right;">Page 144</p> <p>1 surface area up to 1,000 meters square per</p> <p>2 gram.</p> <p>3 A 1,000 meters square. Sorry. Right.</p> <p>4 Q So this reference states that Black Pearl 2000</p> <p>5 has a surface area of 1,475 meters square per</p> <p>6 gram.</p> <p>7 A Okay.</p> <p>8 Q I'm asking you: Is that relatively high as</p> <p>9 compared to what Dr. Haggquist discloses as</p> <p>10 being active?</p> <p>11 MR. SONG: Objection.</p> <p>12 Vague and ambiguous as to "relatively high."</p> <p>13 Calls for speculation. Lacks foundation.</p> <p>14 A It's just shy of one and a half times as much</p> <p>15 to be quantitative.</p> <p>16 Q And then on over to the next page, which</p> <p>17 there's a Figure 2 and then there's text below</p> <p>18 Figure 2. Are you with me?</p> <p>19 A Yes.</p> <p>20 Q The author states in the text, "From the</p> <p>21 viewpoint of tailoring surface properties, BP</p> <p>22 powder in possession of high surface area and</p> <p>23 capability to adsorb water offers a better</p> <p>24 contact with electrolyte ionomer than does VC."</p> <p>25 Do you see that?</p>
<p style="text-align: right;">Page 143</p> <p>1 Q Sir, did you have a chance to -- well, I think</p> <p>2 you already answered this. You said you did</p> <p>3 not review Wang prior to doing your</p> <p>4 declaration?</p> <p>5 A Right.</p> <p>6 Q The Wang article, which is Daniels 15 -- take a</p> <p>7 look at Section 2.1.</p> <p>8 Do you see under 2.1 where the author</p> <p>9 states that "Black Pearl 2000 (BP) has a</p> <p>10 surface area of 1,475 meters square per gram</p> <p>11 and a particle size of 15 nanometers"?</p> <p>12 A Yes, I see that.</p> <p>13 Q So would you agree that that is a relatively</p> <p>14 high surface area as compared to activated</p> <p>15 carbon?</p> <p>16 MR. SONG: Objection.</p> <p>17 Vague, ambiguous as to "relatively high."</p> <p>18 Calls for speculation.</p> <p>19 A Well, I don't have a reference point, again, on</p> <p>20 the activated carbon piece, but I guess if</p> <p>21 you're asking does it approach the 3,000 meters</p> <p>22 squared per gram claim of an activated carbon,</p> <p>23 is that your reference point?</p> <p>24 Q Well, in Dr. Haggquist's declaration, which we</p> <p>25 just looked at, he said active particles have a</p>	<p style="text-align: right;">Page 145</p> <p>1 A I see that.</p> <p>2 Q So this author is stating that BP, Black Pearl,</p> <p>3 has a capability to adsorb water.</p> <p>4 Do you see that?</p> <p>5 A Yes.</p> <p>6 Q Okay. Are you aware of any reference which</p> <p>7 states that Black Pearls 2000 does not adsorb</p> <p>8 water?</p> <p>9 MR. SONG: Objection,</p> <p>10 calls for speculation.</p> <p>11 A As I said earlier, I have really not a lot of</p> <p>12 background information on the properties of</p> <p>13 Black Pearl 2000. So to answer your question,</p> <p>14 no, I've not seen anything.</p> <p>15 Q You're not what?</p> <p>16 A I have not seen anything that suggests it could</p> <p>17 not and so forth.</p> <p>18 Q Sir, take a look at Daniels 16, which is the</p> <p>19 other Wang article.</p> <p>20 A Okay.</p> <p>21 MR. SONG: Same objections</p> <p>22 I stated as to Daniels 16.</p> <p>23 MR. GERGELY: Yes.</p> <p>24 Q Sir, I'd like to draw your attention to Section</p> <p>25 3.1 of the document. It's on --</p>

<p style="text-align: right;">Page 146</p> <p>1 A Okay.</p> <p>2 Q -- page 4911.</p> <p>3 A Got it.</p> <p>4 Q There's a section called "Physical properties of carbon powder."</p> <p>5</p> <p>6 A Uh-huh.</p> <p>7 Q In the text the author states, "The surface area varies greatly from 62 meters square per gram for Acetylene Black to 1501.8 meters square per gram for Black Pearls 2000."</p> <p>8</p> <p>9 Then the author goes on to state, "This can be explained by the tremendous difference in pore volume and pore size distribution. The Black Pearls 2000 reveals smaller particle size and larger pore volume as compared to Acetylene Black, from which we can deduce that the MPL made of Black Pearls 2000 involves more micro-pores than that of Acetylene Black."</p> <p>10</p> <p>11 Do you see that?</p> <p>12</p> <p>13 A I see that.</p> <p>14 Q Earlier I was asking you about pore volume and in Table 2 the pore volume of Black Pearls 2000 is described as 2.67 cubic centimeters per gram.</p> <p>15</p> <p>16 Do you see that?</p> <p>17</p> <p style="text-align: right;">Page 147</p> <p>1 A I do.</p> <p>2 Q In your experience as a person of ordinary skill in the art, is that a relatively high pore volume as compared to activated carbon?</p> <p>3</p> <p>4 MR. SONG: Objection,</p> <p>5</p> <p>6 calls for speculation. Vague and ambiguous as to "relatively high."</p> <p>7</p> <p>8 A Again, I don't have a reference point with respect to the various pore volumes that are capable of being produced in activated carbon, so I would have to see much more information to place Black Pearls 2000 in the field of pore volumes of activated carbon. It would be at this point just a guess as to whether or not I think that's high, medium, or low.</p> <p>9</p> <p>10 Q Okay. Are you aware of what the pore volume is for any active particle that we've discussed today?</p> <p>11</p> <p>12 MR. SONG: Objection.</p> <p>13</p> <p>14 Vague as to "any pore volume." Calls for speculation. Lacks foundation.</p> <p>15</p> <p>16 A The answer to your question is no. I hope we all understand that the pore volume of a material when it's measured is specific to that material. Every substance of a given chemical</p>	<p style="text-align: right;">Page 148</p> <p>1 type may have a range of pore volumes and even within the sample may have a range of pore volume. So this is a nominal value for this particular sample of Black Pearls 2000.</p> <p>2</p> <p>3 Whether they're all like this, I have no idea.</p> <p>4</p> <p>5 Q Will you agree that based on the Wang articles we've seen that Black Pearls 2000 has been described as a porous material?</p> <p>6</p> <p>7 MR. SONG: Objection. The documents speak for themselves. Calls for speculation. Lacks foundation.</p> <p>8</p> <p>9 A Well, the fact that you can measure a pore volume I think pretty much predisposes it to have porous structure.</p> <p>10</p> <p>11 Q Would you agree that in Daniels 15 Wang has described Black Pearls 2000 as having the capability of adsorbing water?</p> <p>12</p> <p>13 MR. SONG: Objection, calls for speculation. It mischaracterizes the document.</p> <p>14</p> <p>15 A In the previous reference we looked at?</p> <p>16</p> <p>17 Q Correct.</p> <p>18</p> <p>19 A Yes, he did say that.</p> <p>20</p> <p>21 Q Okay. At the bottom of 98 in your declaration --</p> <p>22</p> <p style="text-align: right;">Page 149</p> <p>1 A Oh, I'm sorry.</p> <p>2</p> <p>3 Q Sorry. Yes.</p> <p>4</p> <p>5 A No problem. Too many numbers.</p> <p>6</p> <p>7 Q Daniels Exhibit 1, your declaration, paragraph 98, you state that "Indeed, a POSITA understands that carbon soot is too small to be processed into activated carbon, and Dr. Oelker fails to acknowledge this high-relevant fact."</p> <p>8</p> <p>9 Do you see that?</p> <p>10</p> <p>11 A Yes.</p> <p>12</p> <p>13 Q What do you mean by "too small"?</p> <p>14</p> <p>15 A Well, I think we just saw an example of the lampblack or that type of carbon product. And it doesn't create a highly porous high surface area material relative to other structures. As we've read, the surface area depends on the size and the size of the pore volume.</p> <p>16</p> <p>17 This particular version of carbon you're looking at something that's on the low end of the spectrum, simply because it doesn't have the physical features to be functional and have a high pore volume.</p> <p>18</p> <p>19 Q Well, we know that Black Pearls 2000 has a surface area higher than what Dr. Haggquist claimed for active particles, correct?</p> <p>20</p>
<p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p> <p>6</p> <p>7</p> <p>8</p> <p>9</p> <p>10</p> <p>11</p> <p>12</p> <p>13</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>	<p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p> <p>6</p> <p>7</p> <p>8</p> <p>9</p> <p>10</p> <p>11</p> <p>12</p> <p>13</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>

<p style="text-align: right;">Page 150</p> <p>1 MR. SONG: Objection. It</p> <p>2 mischaracterizes the document. It calls for</p> <p>3 speculation. It lacks foundation.</p> <p>4 A The numerical values associated with that</p> <p>5 particular Black Pearls 2000, as I said, was</p> <p>6 about just shy of one and a half times what</p> <p>7 Dr. Haggquist cited in his reference.</p> <p>8 Q Okay.</p> <p>9 A Okay.</p> <p>10 Q With respect to pore volume, we know that Wang</p> <p>11 described Black Pearls 2000 as having a pore</p> <p>12 volume of 2.67 cubic centimeters per gram, but</p> <p>13 you're not aware of what the pore volume may be</p> <p>14 for other active particles, say activated</p> <p>15 carbon or silica gel or anything else, correct?</p> <p>16 MR. SONG: Objection.</p> <p>17 Lacks foundation. Calls for speculation.</p> <p>18 A Right. I would only be guessing as to what</p> <p>19 those pore volumes or those surfaces areas are</p> <p>20 without actually seeing some hard data on the</p> <p>21 materials.</p> <p>22 Q Right. So you can't say that Black Pearls 2000</p> <p>23 has a relatively small pore volume without</p> <p>24 seeing other data, correct?</p> <p>25 A I can't place it, as I said, on the spectrum of</p>	<p style="text-align: right;">Page 152</p> <p>1 Q It looks like under "Example 1" he says that</p> <p>2 the "mean particle size 13 nanometers."</p> <p>3 MR. SONG: Are you at line</p> <p>4 20?</p> <p>5 MR. GERGELY: Yeah.</p> <p>6 A Yes.</p> <p>7 Q So is that what you were referring to as being</p> <p>8 too small to be processed into activated</p> <p>9 carbon?</p> <p>10 A 13 nanometers or carbon soot? I was referring</p> <p>11 to carbon soot.</p> <p>12 Q Oh, okay. Well, in paragraph 98 you were</p> <p>13 referring to carbon black or soot in Halley.</p> <p>14 So I guess what was your thought on what she</p> <p>15 was referring to or what Halley was referring</p> <p>16 to?</p> <p>17 MR. SONG: Objection. It</p> <p>18 calls for speculation.</p> <p>19 A I'm a little confused here. I thought it was</p> <p>20 pretty specific. When I said that carbon soot</p> <p>21 is too small, I'm specifically referring to</p> <p>22 carbon soot.</p> <p>23 Q Just generally?</p> <p>24 A Just generally.</p> <p>25 MR. SONG: Objection.</p>
<p style="text-align: right;">Page 151</p> <p>1 high versus low versus medium without seeing</p> <p>2 other data.</p> <p>3 Q So back to your declaration. When you say that</p> <p>4 carbon soot is too small to be processed into</p> <p>5 activated carbon, what do you mean? Do you</p> <p>6 mean by --</p> <p>7 A Physical size.</p> <p>8 Q The diameter is small?</p> <p>9 A Right. Physical size.</p> <p>10 Q Because Wang -- well, what did Halley say the</p> <p>11 size of these particles were?</p> <p>12 MR. SONG: Objection,</p> <p>13 calls for speculation.</p> <p>14 Q Well, are you -- I think in his preferred</p> <p>15 embodiment he said that the Black Pearls 2000</p> <p>16 was something on the order of was it 13 or 15</p> <p>17 nanometers?</p> <p>18 MR. SONG: Objection.</p> <p>19 Calls for speculation. Mischaracterizes the</p> <p>20 document. If you would like to refer to the</p> <p>21 document, you may do so.</p> <p>22 MR. GERGELY: Sure. Why</p> <p>23 don't we take a look at Halley.</p> <p>24 Q So page 7 of Halley.</p> <p>25 A Page 7.</p>	<p style="text-align: right;">Page 153</p> <p>1 Q I understand. So you're not necessarily</p> <p>2 referring to Black Pearls 2000, right?</p> <p>3 MR. SONG: Objection.</p> <p>4 Mischaracterizes the witness' testimony.</p> <p>5 A I did not call out Black Pearls 2000 in this</p> <p>6 specific -- in that specific sentence, no.</p> <p>7 Q Understood. So what is the diameter size of</p> <p>8 carbon soot?</p> <p>9 A Pretty small. I don't know exactly what it is,</p> <p>10 but it's extremely small.</p> <p>11 Q Can you give me a range?</p> <p>12 A I can't. All I know is if you've ever gotten</p> <p>13 it on you, it penetrates very quickly. It's a</p> <p>14 very small particle, but I don't know the</p> <p>15 exact -- I've never measured it, but it's</p> <p>16 small.</p> <p>17 Q Is it less than a micron?</p> <p>18 A That would be a total guess. I really don't</p> <p>19 know.</p> <p>20 Q Okay. Well, you're taking the position that</p> <p>21 it's too small and so I'm trying to get a</p> <p>22 handle on what "too small" means.</p> <p>23 A I understand, but since I don't have a size to</p> <p>24 give you, it would be a wild guess on my part</p> <p>25 as to what that carbon soot diameter is without</p>

<p style="text-align: right;">Page 154</p> <p>1 actually doing the measurement.</p> <p>2 Q Well, I guess that's what I'm trying to get at.</p> <p>3 How can you conclude that carbon soot is too</p> <p>4 small to be processed into activated carbon</p> <p>5 unless you know how big it is?</p> <p>6 MR. SONG: Objection,</p> <p>7 argumentative.</p> <p>8 A My point is that it is one of the finer --</p> <p>9 finest versions of carbon. In fact, very</p> <p>10 difficult to handle at all relative to the</p> <p>11 carbon blacks that are usually incorporated in</p> <p>12 other materials. So if I had a number, I would</p> <p>13 give it to you, but it would be a total guess</p> <p>14 on my part.</p> <p>15 Q Okay. Well, what type of particle would be</p> <p>16 large enough to be processed into an activated</p> <p>17 particle?</p> <p>18 MR. SONG: Objection.</p> <p>19 Outside the scope. Calls for speculation.</p> <p>20 Lacks foundation.</p> <p>21 A I'm not a carbon black particle expert with</p> <p>22 respect to size and pore volume correlations,</p> <p>23 so, again, it would be pure speculation on my</p> <p>24 part to be able to define for you what that</p> <p>25 critical level is without actually seeing some</p>	<p style="text-align: right;">Page 156</p> <p>1 quickly, I don't know.</p> <p>2 So, again, putting it into context of is</p> <p>3 it too small, too large, or just right, it's a</p> <p>4 little bit of a Goldilocks phenomenon I'm</p> <p>5 trying to deal with here. I don't know where</p> <p>6 the demarcation lines lie with respect to</p> <p>7 optimum performance or acceptable performance,</p> <p>8 unless I would see that kind of information for</p> <p>9 various varieties of the carbon black</p> <p>10 materials.</p> <p>11 Q Sir, turning your attention to Halley --</p> <p>12 A Okay.</p> <p>13 Q -- which is Daniels 13. I'd like to draw your</p> <p>14 attention to Table 1 on page 8.</p> <p>15 A Okay.</p> <p>16 Q Do you understand Table 1 to be disclosing a</p> <p>17 control and then three experiments with the</p> <p>18 added Black Pearls 2000?</p> <p>19 A Yes.</p> <p>20 Q As I understand what you're saying, Table 1 is</p> <p>21 not relevant because the MVTR ranges are</p> <p>22 outside the claimed range, is that right?</p> <p>23 MR. SONG: Objection.</p> <p>24 Calls for speculation --</p> <p>25 A I don't believe --</p>
<p style="text-align: right;">Page 155</p> <p>1 hard data.</p> <p>2 Q So we have your conclusion, but you can't tell</p> <p>3 me how small is too small or how large is</p> <p>4 acceptable, is that right?</p> <p>5 MR. SONG: Objection,</p> <p>6 asked and answered.</p> <p>7 A That what I said. I said unless I had some</p> <p>8 numbers to go by, it would be a complete guess</p> <p>9 on my part where the demarcation line would be</p> <p>10 to be either too small or too large.</p> <p>11 Q Do you believe that 13 nanometers is too small?</p> <p>12 MR. SONG: Objection,</p> <p>13 asked and answered.</p> <p>14 Q That being the diameter of Black Pearls 2000.</p> <p>15 A I think in the case of the Black Pearls 2000</p> <p>16 you have an average particle size of around,</p> <p>17 what did we say, 13 microns.</p> <p>18 Q Nanometers.</p> <p>19 A Sorry. 13 nanometers. And we've already said</p> <p>20 that there are citations which call out the</p> <p>21 fact that it can absorb water. So my guess is</p> <p>22 the 13 nanometers average particle size and the</p> <p>23 water absorption characteristics of Black</p> <p>24 Pearls 2000 says it must work in terms of</p> <p>25 absorbing water. How much, I don't know. How</p>	<p style="text-align: right;">Page 157</p> <p>1 MR. SONG: Legal</p> <p>2 conclusion.</p> <p>3 THE WITNESS: Sorry.</p> <p>4 A I don't believe I said that about Table 1.</p> <p>5 What I said about Table 1 was that there's some</p> <p>6 peculiarities in how the material responds to</p> <p>7 the increase in particle percent weight.</p> <p>8 In the first place these numbers are not</p> <p>9 very different from one another, whether it's</p> <p>10 17,000 or 16,000 or 14,000. We'll leave that</p> <p>11 alone for a moment.</p> <p>12 But if you accept the direction in which</p> <p>13 they go, it seems to suggest that if I put more</p> <p>14 in I get poor or lower MVTR or no change at</p> <p>15 all.</p> <p>16 So the point I was making with respect to</p> <p>17 my criticism, particularly of Oelker's</p> <p>18 interpretation of Table 1, was with the MVTR</p> <p>19 values are nearly invariant, depending upon the</p> <p>20 amount of carbon black that you put in or the</p> <p>21 samples 1 through 3.</p> <p>22 My point is if the carbon is allegedly</p> <p>23 improving the MVTR, you would expect to see</p> <p>24 something fairly consistent and directionally</p> <p>25 increasing with the amount of carbon black</p>

<p style="text-align: right;">Page 158</p> <p>1 contained in the material. And that's not</p> <p>2 seen.</p> <p>3 <b>Q Well, it appears to go up, then down, then up.</b></p> <p>4 A Well --</p> <p>5 MR. SONG: Objection.</p> <p>6 There's no question pending.</p> <p>7 A Okay. It may appear to be that way, but you've</p> <p>8 got five times as much in sample 3 than you</p> <p>9 have in sample 1. And you have a whole lot</p> <p>10 more than the control. Okay. The control is</p> <p>11 lower than the group of three. So if the</p> <p>12 carbon black is really enhancing the MVTR</p> <p>13 performance, it's not doing it very</p> <p>14 effectively.</p> <p>15 <b>Q Well, in terms of percentage, Halley is</b></p> <p>16 <b>adding -- do you understand the particle weight</b></p> <p>17 <b>as a percentage of the membrane to be .3</b></p> <p>18 <b>percent in the first example?</b></p> <p>19 A Yes.</p> <p>20 <b>Q And then the second example is .65, right?</b></p> <p>21 A Correct.</p> <p>22 <b>Q And then the third example is 1.5?</b></p> <p>23 A Right.</p> <p>24 <b>Q In each three of those examples, as compared to</b></p> <p>25 <b>control, the MVTR is an improvement over the</b></p>	<p style="text-align: right;">Page 160</p> <p>1 that's probably outside the normal experimental</p> <p>2 error.</p> <p>3 As you proceed through the samples 1, 2,</p> <p>4 and 3, I'm not seeing the improvement that I</p> <p>5 would expect if this material of choice were</p> <p>6 really doing the enhancement that Halley</p> <p>7 expects or tries to get you to believe should</p> <p>8 have happened. And that was the point I was</p> <p>9 trying to make.</p> <p>10 <b>Q And then Table 2, I think you pointed out that</b></p> <p>11 <b>the MVTR is actually going down in the</b></p> <p>12 <b>experiment versus control, that there's no</b></p> <p>13 <b>improvement, correct?</b></p> <p>14 A Well, again it depends upon what the accuracy</p> <p>15 and reproducibility of the measurements are,</p> <p>16 none of which were ever disclosed in the patent</p> <p>17 application. So I don't know whether that</p> <p>18 difference is real or whether that difference</p> <p>19 is within experimental error. But there again</p> <p>20 you're not seeing the big difference if you</p> <p>21 accept those as averages or reproducible</p> <p>22 results.</p> <p>23 And that's the other point. Are these</p> <p>24 one-off measurements a series of three, a</p> <p>25 series of five? You just don't know. So you</p>
<p style="text-align: right;">Page 159</p> <p>1 control, correct?</p> <p>2 A I will grant you that.</p> <p>3 MR. SONG: Objection.</p> <p>4 Vague as to "improvement."</p> <p>5 <b>Q You said he's not doing it very effectively,</b></p> <p>6 <b>but in terms of particle loading, these</b></p> <p>7 <b>percentages are significantly lower than what</b></p> <p>8 <b>Halley -- excuse me, than what Dr. Haggquist</b></p> <p>9 <b>was doing, right?</b></p> <p>10 MR. SONG: Objection.</p> <p>11 Vague as to "significantly lower." Lacks</p> <p>12 foundation. Mischaracterizes Haggquist's</p> <p>13 testimony.</p> <p>14 A I guess I'm missing the point. Let's not</p> <p>15 compare apples and oranges, because within</p> <p>16 Halley's construction you're starting out with</p> <p>17 a known composition of the control, to which he</p> <p>18 is adding various amounts. I think it's unfair</p> <p>19 to say well, I'm getting a better value here</p> <p>20 without considering the fact that the material</p> <p>21 of construction is different in the Haggquist</p> <p>22 patent versus this.</p> <p>23 So if we take each of those by</p> <p>24 themselves, certainly the control versus that</p> <p>25 with the additional carbon is lower. I think</p>	<p style="text-align: right;">Page 161</p> <p>1 take the numbers at face value when you compare</p> <p>2 them to one another. Nothing seems to be</p> <p>3 happening.</p> <p>4 <b>Q And then in Table 3, which is the "fabric &amp;</b></p> <p>5 <b>membrane &amp; dots," all of the experiments versus</b></p> <p>6 <b>control independently show an improvement over</b></p> <p>7 <b>the control, correct?</b></p> <p>8 A The values are higher, but again, there's this</p> <p>9 odd happening that you seem to reach a value in</p> <p>10 the 7700 range and then you drop off at one and</p> <p>11 a half parts, which is inconsistent with more</p> <p>12 is better.</p> <p>13 <b>Q Well, Dr. Haggquist didn't claim more is</b></p> <p>14 <b>better, he just claimed an improved MVTR,</b></p> <p>15 <b>correct?</b></p> <p>16 MR. SONG: Objection.</p> <p>17 Calls for speculation. Mischaracterizes the</p> <p>18 underlying testimony.</p> <p>19 A Well, let's go back to the fundamentals here.</p> <p>20 We're adding this material allegedly to provide</p> <p>21 increased surface area to improve the amount of</p> <p>22 adsorbed moisture. I'm just focusing on each</p> <p>23 set of experiments independent from one</p> <p>24 another.</p> <p>25 I look at those numbers and I say I'm not</p>

<p style="text-align: right;">Page 162</p> <p>1 seeing the improvement you would anticipate</p> <p>2 comparing one amount to more to even more. If</p> <p>3 that's what it's doing and that's the intention</p> <p>4 to which it is being added -- for which it's</p> <p>5 being added, you're not seeing the improvement.</p> <p>6 You can't argue with the numbers.</p> <p>7 Q Well, I guess I will argue with the numbers.</p> <p>8 A Okay.</p> <p>9 Q In terms of Haggquist, in his up cup method of</p> <p>10 measuring MVTR, he was showing improvements</p> <p>11 similar to what Halley was showing, correct?</p> <p>12 MR. SONG: Objection.</p> <p>13 Mischaracterizes the underlying document.</p> <p>14 Lacks foundation. Calls for speculation.</p> <p>15 Counsel's testifying.</p> <p>16 A I would have to go back and look at Haggquist's</p> <p>17 numbers.</p> <p>18 Q Okay.</p> <p>19 A But, I mean, this is a more extensive study</p> <p>20 with respect to amounts than I think --</p> <p>21 especially since there's several iterations.</p> <p>22 That would be which exhibit again?</p> <p>23 Q Oh, Halley -- excuse me. Haggquist was --</p> <p>24 excuse me. It was Daniels 10.</p> <p>25 A 10. Okay.</p>	<p style="text-align: right;">Page 164</p> <p>1 Q Yes.</p> <p>2 A Okay.</p> <p>3 Q In the next example he adds 20 grams of carbon,</p> <p>4 10 grams of surfactant?</p> <p>5 A Right.</p> <p>6 Q And he sees a modest increase to 6631.</p> <p>7 Do you see that?</p> <p>8 A I do.</p> <p>9 Q That's, what, on the order of 4 or 5 percent?</p> <p>10 A Yes.</p> <p>11 Q And then in the next example he adds 40 grams</p> <p>12 of carbon and 20 grams of surfactant, and then</p> <p>13 he gets another increase over control of about,</p> <p>14 what, about 800 grams per meter square per day</p> <p>15 versus control?</p> <p>16 A Versus control.</p> <p>17 Q Is that roughly, what, a --</p> <p>18 A 12 percent.</p> <p>19 Q A 12 percent increase?</p> <p>20 A Yeah.</p> <p>21 Q And then in his next example he loads even more</p> <p>22 carbon in. 80 grams of carbon, 40 grams of</p> <p>23 surfactant and he sees an increase of about 320</p> <p>24 versus control, correct?</p> <p>25 A Yes.</p>
<p style="text-align: right;">Page 163</p> <p>1 Q So take a look at Figure 2 in Daniels 10.</p> <p>2 A Figure 2.</p> <p>3 MR. SONG: Can we have a</p> <p>4 break now? Do you want to finish a couple</p> <p>5 more?</p> <p>6 MR. GERGELY: No, that's</p> <p>7 fine. Let's take a break. Let's take a break.</p> <p>8 - - - - -</p> <p>9 (Recess taken.)</p> <p>10 - - - - -</p> <p>11 BY MR. GERGELY:</p> <p>12 Q So, sir, why don't you take out the '287</p> <p>13 patent, which is Daniels 10, and then compare</p> <p>14 it to Table 3 on Halley, which is Daniels 13.</p> <p>15 A Okay. So, again, we're comparing Figure 2</p> <p>16 '287, correct?</p> <p>17 Q Yeah.</p> <p>18 A Against table which?</p> <p>19 Q 3.</p> <p>20 A 3. Okay. All right. Well ...</p> <p>21 Q I would like to draw your attention to Figure 2</p> <p>22 of the Haggquist '287 patent, specifically the</p> <p>23 control and the inverted cup method.</p> <p>24 Do you see that?</p> <p>25 A Okay. Control in the inverted cup, 6356.</p>	<p style="text-align: right;">Page 165</p> <p>1 Q So he's back down in the 5 percent improvement</p> <p>2 range, right?</p> <p>3 A Right.</p> <p>4 Q Now drawing your attention over to Halley,</p> <p>5 Table 3, he adds about .3 percent on a weight</p> <p>6 percentage basis of carbon particles and he</p> <p>7 sees an increase of about 1400 versus control.</p> <p>8 Do you see that?</p> <p>9 A Yes.</p> <p>10 Q So that's over 20 percent, correct?</p> <p>11 A Correct.</p> <p>12 Q And then he adds yet more in the next</p> <p>13 experiment and he sees about the exact same</p> <p>14 improvement, about 20 percent.</p> <p>15 Do you see that?</p> <p>16 A Yes.</p> <p>17 Q And then in the last experiment he adds yet</p> <p>18 more and then he actually see a decrease versus</p> <p>19 the last experiment but still an improvement.</p> <p>20 Do you see that?</p> <p>21 A I do.</p> <p>22 Q So in the last experiment he's about 10 percent</p> <p>23 better than control, right?</p> <p>24 A Yeah. That's fine.</p> <p>25 Q So as compared to Haggquist's up cup -- excuse</p>

<p style="text-align: right;">Page 166</p> <p>1 me, inverted cup method, the improvement over</p> <p>2 control in Haggquist is actually better than</p> <p>3 what -- excuse me.</p> <p>4 The improvement over control in Halley is</p> <p>5 actually better than what Haggquist reported</p> <p>6 for his inverted cup method --</p> <p>7 MR. SONG: Objection.</p> <p>8 Q -- is that correct?</p> <p>9 MR. SONG: Sorry.</p> <p>10 Objection. Vague as to the term "better."</p> <p>11 Incomplete hypothetical as to the experimental</p> <p>12 conditions of Halley. That calls for</p> <p>13 speculation.</p> <p>14 Q Well, on a percentage basis Haggquist is</p> <p>15 getting -- excuse me.</p> <p>16 On a percentage basis Halley is getting</p> <p>17 better result than Haggquist, correct?</p> <p>18 MR. SONG: Objection.</p> <p>19 Incomplete hypothetical. Vague and ambiguous</p> <p>20 as to the term "better results." Calls for</p> <p>21 speculation.</p> <p>22 A Okay. I think you can't ignore and I think</p> <p>23 there's a tendency to do so. First of all, we</p> <p>24 don't even know specifically the composition</p> <p>25 structure characteristics of the urethane. We</p>	<p style="text-align: right;">Page 168</p> <p>1 showed a similar trend to what Haggquist showed</p> <p>2 in terms of as more carbon was put in, you saw</p> <p>3 an improvement, and then when yet more carbon</p> <p>4 was put in in the last example of each</p> <p>5 reference, the MVTR actually dropped?</p> <p>6 MR. SONG: Objection.</p> <p>7 Vague as to the type of carbon being referenced</p> <p>8 in the question. Calls for speculation. Lacks</p> <p>9 foundation.</p> <p>10 A Well, the first thing is I don't know</p> <p>11 whether --</p> <p>12 Q Well, I'm asking you because earlier you were</p> <p>13 saying that Halley's results were equivocal</p> <p>14 because there was no clear trend of improving</p> <p>15 MVTR as you loaded more carbon in. I'm just</p> <p>16 simply trying to point out to you and would you</p> <p>17 agree that that same trend is actually shown in</p> <p>18 the Haggquist '287 patent?</p> <p>19 MR. SONG: Objection.</p> <p>20 Calls for speculation. Mischaracterizes the</p> <p>21 document not. All of the control groups were</p> <p>22 discussed in the '287 patent. I'm sorry. Not</p> <p>23 control group. Not all of the groups and tests</p> <p>24 were discussed in the Haggquist patent.</p> <p>25 Incomplete hypothetical.</p>
<p style="text-align: right;">Page 167</p> <p>1 seem to be just focusing on amount of carbon</p> <p>2 black outcome.</p> <p>3 I think it's improper to do that, number</p> <p>4 1, because I have no assurance and no knowledge</p> <p>5 that the material upon which the second layer</p> <p>6 in Haggquist's case or the additional carbon in</p> <p>7 Halley case -- we are comparing apples and</p> <p>8 oranges here.</p> <p>9 I mean clearly they both are attempting</p> <p>10 to show that the amount of carbon black within</p> <p>11 this grouping has an effect on moisture vapor</p> <p>12 transmission, but to compare these values in</p> <p>13 Halley against these values in Haggquist</p> <p>14 ignores the impact of the other materials</p> <p>15 within the composition. So it truly is an</p> <p>16 apples and oranges comparison.</p> <p>17 If you want to look at within a group,</p> <p>18 within a construction, we can discuss whether</p> <p>19 it's going up or whether it's going down, but</p> <p>20 to either compare values or percentage</p> <p>21 increase, it seems to be to ignore the fact</p> <p>22 that there's more in there that has an effect</p> <p>23 on the moisture vapor transmission rate than</p> <p>24 just simply the carbon black.</p> <p>25 Q Well, would you agree with me that Halley</p>	<p style="text-align: right;">Page 169</p> <p>1 A Well, there's a couple things that are not</p> <p>2 understood with respect to the Halley patent.</p> <p>3 I don't know whether they're using the up cup</p> <p>4 or the inverted cup method, number one.</p> <p>5 Number two, he has three data points</p> <p>6 compared to his control, Haggquist has more.</p> <p>7 The amounts used in the Haggquist patent are</p> <p>8 considerably different amounts of carbon black</p> <p>9 versus that in the Halley patent.</p> <p>10 The substrate issues which I mentioned</p> <p>11 are still not described specifically in one</p> <p>12 case versus the other in terms of how they</p> <p>13 compare.</p> <p>14 So in order for me to say that the trends</p> <p>15 are the same or the percent changes are more in</p> <p>16 one versus the other presupposes that I know a</p> <p>17 whole lot more than I'm being told.</p> <p>18 Q Well, on a percentage basis relative to the</p> <p>19 weight of the material, would you agree with me</p> <p>20 that Black Pearls 2000 appears to be much more</p> <p>21 effective than activated carbon?</p> <p>22 MR. SONG: Objection.</p> <p>23 Vague and ambiguous as to "much more</p> <p>24 effective." Lacks foundation. Calls for a</p> <p>25 legal conclusion.</p>

<p style="text-align: right;">Page 170</p> <p>1 A I don't think you can conclude that independent 2 of the other materials within the construction 3 of the membrane that he's testing. It's not 4 there just passively. We've seen claims that 5 they're microporous materials. And so I think 6 you have to take the entire system into account 7 before you can make claims that one is more 8 effective than the other.</p> <p>9 And I think the same applies in 10 attempting to compare numbers, absolute numbers 11 in one with the other, because there are too 12 many unknowns with respect to the overall 13 composition in one case versus the other.</p> <p>14 So I hate to keep using the example, but 15 to me it's an apples and oranges comparison. 16 We can only look at what happens within a given 17 set of information, in a given set of compounds 18 in Halley. Whatever happens, happens. And the 19 same thing in the '287 patent, whatever 20 happens, happens.</p> <p>21 Trends in one, trends in the other 22 shouldn't be compared to one another unless you 23 have a whole lot more information and can 24 understand some rationale as to why.</p> <p>25 One and a half parts maximum in the</p>	<p style="text-align: right;">Page 172</p> <p>1 them in the '287 patent and I don't know them 2 in the Halley patent.</p> <p>3 So whether 7155 is different from 6673 4 depends upon how many times I run the 5 experiment in my a priori knowledge of whether 6 or not this is a 5 to 10 percent error in his 7 actual measurements or a real 5 to 10 percent 8 difference. I don't know that in either case.</p> <p>9 So all you can do is speculate on trends 10 and I think it's an unfair case to do that, 11 especially if you're trying to say well, this 12 one's more effective than that.</p> <p>13 Q So if I understood your testimony, your same 14 criticisms of Halley with respect to 15 reproducibility, you could also level those 16 same criticisms at the '287 patent, correct?</p> <p>17 MR. SONG: Objection. It 18 mischaracterizes the witness' testimony. It 19 calls for speculation.</p> <p>20 A What I'm saying is I have the same lack of 21 information with respect to -- I don't know how 22 reproducible one set of data are in one patent 23 versus the other, whether Haggquist's 24 measurements are more, reproducible with a 25 tighter span than Halley's, or the reverse.</p>
<p style="text-align: right;">Page 171</p> <p>1 Halley patent, way out of the range of the 2 first and second experiments controlled in 3 number 1 in the '287 patent. So we're talking 4 about totally different ranges and we're -- I'm 5 being asked to interpolate between these levels 6 and compare them. I just think that's pure 7 speculation without knowing more about the 8 overall construction.</p> <p>9 Q Well, the reason I'm asking you this line of 10 questions is because you were critical of the 11 Halley data. Let's set Halley aside for now.</p> <p>12 On Figure 2 looking at control versus 13 experiments 1, 2, and 3, on the inverted cup 14 method, what does it tell you about the MVTR 15 improving slightly as the carbon is added in 16 greater amounts and then in the third 17 experiment it tails off when the most carbon is 18 put in?</p> <p>19 MR. SONG: Objection. 20 Incomplete hypothetical. The question ignores 21 several of the experimental tests in the 22 figure.</p> <p>23 A Well, I will level the same criticism of the 24 data cited in the '287 patent with respect to 25 reproducibility and error bars. I don't know</p>	<p style="text-align: right;">Page 173</p> <p>1 And the limited set of data here in the 2 Halley situation seems to me to suggest without 3 having more data that there's a lack of -- 4 there's a lack of certainty on my part as to 5 whether there's any trend at all.</p> <p>6 Q Now back to your declaration, which is Daniels 7 1.</p> <p>8 A Okay.</p> <p>9 Q In paragraph 99 you say that "Second, a POSITA 10 would understand Halley, like Dutta, to involve 11 hydrophilic matter (a hydrophilic coating) that 12 operates solely by absorption and swelling, but 13 with the addition of particulate solids added 14 for strength and abrasion resistance."</p> <p>15 Do you see that?</p> <p>16 A Yes.</p> <p>17 Q The hydrophilic coating is the polyurethane, 18 correct?</p> <p>19 MR. SONG: Objection, 20 calls for speculation.</p> <p>21 A No. The hydro -- oh, I'm sorry. Yes, with the 22 addition of the particulate solids. No. Stop.</p> <p>23 The hydrophilic matter is the combination 24 of the hydrophilic material and the membrane 25 material rendering the whole thing hydrophilic.</p>

<p style="text-align: right;">Page 174</p> <p>1 And what I'm contrasting there is the addition</p> <p>2 of particular solids for strength and abrasion</p> <p>3 resistance, not for added moisture vapor</p> <p>4 transmission enhancement.</p> <p>5 Q It -- oh, sorry. Go ahead.</p> <p>6 A Halley's position is the particulates were</p> <p>7 added for strength and abrasion. To what does</p> <p>8 he add it? To what have they been added? This</p> <p>9 hydrophilic composition, which consists both of</p> <p>10 the hydrophilic additives and the polyurethane,</p> <p>11 I guess, material in which it's mixed.</p> <p>12 Q Why are you describing Black Pearls 2000 as the</p> <p>13 hydrophilic additive? Where do you get that</p> <p>14 from?</p> <p>15 A I'm not talking about the Black Pearls 2000</p> <p>16 being a hydrophilic additive. I'm talking</p> <p>17 about some of the other --</p> <p>18 Q You're talking about the polyurethane as being</p> <p>19 hydrophilic, correct?</p> <p>20 A Polyurethane is hydrophilic. And also in</p> <p>21 Dutta -- or rather Halley talking about</p> <p>22 materials which are not only the hydrophilic</p> <p>23 urethane for the membrane but also to which</p> <p>24 he's added -- where am I looking at those.</p> <p>25 Q Well, drawing your attention to page 2, lines</p>	<p style="text-align: right;">Page 176</p> <p>1 make sense.</p> <p>2 Q In Halley, Halley is using polyurethane</p> <p>3 material and adding in Black Pearls 2000. So</p> <p>4 he's using a hydrophilic base and then he's</p> <p>5 adding in some material which we can debate</p> <p>6 about whether it's adsorbent or not, correct?</p> <p>7 A Correct.</p> <p>8 Q So what's your point you're making in paragraph</p> <p>9 99 and 100?</p> <p>10 A My point is that the intention of adding of</p> <p>11 those particular solids were specifically</p> <p>12 called out by Halley to add strength to the</p> <p>13 overall structure and abrasion resistance.</p> <p>14 That was the rationale for adding it.</p> <p>15 Q Okay.</p> <p>16 A He says that in paragraph 15.</p> <p>17 Q I see.</p> <p>18 But a person of ordinary skill in the art</p> <p>19 would be aware of the literature which</p> <p>20 describes Black Pearls 2000 as adsorbing water,</p> <p>21 correct?</p> <p>22 MR. SONG: Objection.</p> <p>23 Calls for speculation. Vague as to "the</p> <p>24 literature."</p> <p>25 Q Well, we looked at the Wang references,</p>
<p style="text-align: right;">Page 175</p> <p>1 24 through 35.</p> <p>2 A Right. Okay. You've got the substrate. The</p> <p>3 porous membrane. Polyethylene. Correct?</p> <p>4 Q Yeah. It looks like it could be a number of</p> <p>5 things.</p> <p>6 A Suitable polymers in terms of the hydrophilic</p> <p>7 polymer material would be -- could be</p> <p>8 polyurethanes, could be polyesters, polyethers,</p> <p>9 et cetera.</p> <p>10 Okay. So I'm not sure where we're</p> <p>11 getting to addition of the Black Pearls 2000 as</p> <p>12 a hydrophilic material. I'm just talking about</p> <p>13 polymer one --</p> <p>14 Q Okay.</p> <p>15 A -- on the substrate.</p> <p>16 Q So in Haggquist the base material he was using</p> <p>17 was polyurethane, though, correct?</p> <p>18 A Yes.</p> <p>19 Q So that is, likewise, hydrophilic?</p> <p>20 A Yes.</p> <p>21 Q Okay. And Haggquist is adding in activated</p> <p>22 carbon, which is, what, hydrophilic or</p> <p>23 hydrophobic?</p> <p>24 A Well, it's an adsorbent material. It could be</p> <p>25 classified as being a hydrophilic. That would</p>	<p style="text-align: right;">Page 177</p> <p>1 correct?</p> <p>2 MR. SONG: Same standing</p> <p>3 objection as to Daniels 16.</p> <p>4 A If you accept Wang, again, which I didn't</p> <p>5 review the detail, who alleges that Black</p> <p>6 Pearls 2000 adsorbs water. That's his</p> <p>7 contention. Fine.</p> <p>8 But in Halley, when he's talking about</p> <p>9 adding the particulate solid material, he</p> <p>10 doesn't saying he's doing it for that purpose.</p> <p>11 He says he's doing it for improvements in</p> <p>12 physical properties, flexile rigidity, tensile</p> <p>13 and abrasion resistance. So if he's getting a</p> <p>14 freebie, he certainly doesn't acknowledge it.</p> <p>15 Q Well, sir, a person of ordinary skill would</p> <p>16 read Table 3 as showing improved MVTR when</p> <p>17 those Black Pearls 2000 particles are added,</p> <p>18 correct, versus control?</p> <p>19 A You see an improvement, right.</p> <p>20 Q Sir, under paragraph 104, you state that</p> <p>21 "Halley makes no mention of the criticality of</p> <p>22 the ratio of the dimensions of the composite</p> <p>23 structure layers. These ratios are described</p> <p>24 as imperatives in the '287 Patent."</p> <p>25 Where does it say that in the '287</p>

<p style="text-align: right;">Page 178</p> <p>1 patent, that that's imperative?</p> <p>2 A I've got an unbound copy of it and I lost a</p> <p>3 page of it. So let me find it.</p> <p>4 Q Uh-oh.</p> <p>5 A There it is.</p> <p>6 Q We got it in the right order?</p> <p>7 A I think so.</p> <p>8 Q So the question was: Where in the '287 patent</p> <p>9 does the inventor describe the ratios as an</p> <p>10 imperative?</p> <p>11 A Well, in column 9 he describes an example he</p> <p>12 made where he's attempting to make some</p> <p>13 specific dimensions of the film and the</p> <p>14 substrate.</p> <p>15 And he says in column 10 under the</p> <p>16 claims, "A second thickness wherein the first</p> <p>17 thickness is at least two and a half times</p> <p>18 larger than the second thickness but less than</p> <p>19 an order of magnitude larger than the second</p> <p>20 thickness."</p> <p>21 So he cites it there for certain.</p> <p>22 Q Okay. So in the claims, but I'm saying</p> <p>23 anywhere in the spec does he say that these</p> <p>24 ratios are critical or important?</p> <p>25 MR. SONG: Objection,</p>	<p style="text-align: right;">Page 180</p> <p>1 Q Okay. Then it says, "The mixture was dried and</p> <p>2 cured in an oven, where at least a portion of</p> <p>3 the protective substance was removed (e.g.,</p> <p>4 evaporated off), resulting in a membrane coated</p> <p>5 on a substrate, the membrane having a thickness</p> <p>6 of one mil."</p> <p>7 Do you see that?</p> <p>8 A Yes.</p> <p>9 Q So what's your understanding of what the</p> <p>10 mixture is? Is the mixture the polyurethane</p> <p>11 and the activated carbon?</p> <p>12 A In example 1, that's my understanding of it.</p> <p>13 Q And then when it says "the membrane having a</p> <p>14 thickness of one mil," is the membrane the</p> <p>15 activated carbon and polyurethane mixture</p> <p>16 that's cured?</p> <p>17 MR. SONG: Objection,</p> <p>18 vague as to "polyurethane and activated carbon</p> <p>19 mixture."</p> <p>20 Q Well, it says, "resulting in a membrane coated</p> <p>21 on a substrate, the membrane having a thickness</p> <p>22 of one mil."</p> <p>23 So what is your understanding of what the</p> <p>24 membrane includes?</p> <p>25 A My understanding is that if we accept the fact</p>
<p style="text-align: right;">Page 179</p> <p>1 vague as to "critical or important."</p> <p>2 Q Well, in your declaration you said that the</p> <p>3 ratio is described as an imperative, and I'm</p> <p>4 asking you where in the specification apart</p> <p>5 from the claims is it described that the ratio</p> <p>6 is imperative?</p> <p>7 A It's my interpretation if somebody says it has</p> <p>8 to be between A and B that that's important.</p> <p>9 That's how I reached that conclusion.</p> <p>10 Q Now, sir, you had mentioned column 9.</p> <p>11 A Yes.</p> <p>12 Q Well, let's start on column 8.</p> <p>13 Do you see in column 8, example 1</p> <p>14 Dr. Haggquist states "Polyurethane solutions</p> <p>15 were combined with protective activated</p> <p>16 carbon"?</p> <p>17 A Yes.</p> <p>18 Q He says, "The protected activated carbon was</p> <p>19 suspended in the polyurethane solution and the</p> <p>20 mixture was applied to a nylon woven fabric."</p> <p>21 A Right.</p> <p>22 Q Do you see that?</p> <p>23 And that the nylon woven fabric is not</p> <p>24 part of the cured base material, is it?</p> <p>25 A No, not in that example.</p>	<p style="text-align: right;">Page 181</p> <p>1 that the substrate in this particular case is</p> <p>2 the nylon woven fabric, then the membrane has</p> <p>3 to be the composition resulting from the</p> <p>4 mixture of the activated carbon in the</p> <p>5 polyurethane.</p> <p>6 Q Okay. And then on over to the next column,</p> <p>7 under column 9 the inventor states, "Membranes</p> <p>8 were also produced by drawing down the mixture</p> <p>9 on release paper. These membranes were cured</p> <p>10 and dried in an oven and then removed from the</p> <p>11 release paper yielding a self-supporting</p> <p>12 membrane. This membrane was one mil thick."</p> <p>13 A Right.</p> <p>14 Q What is your understanding of what is included</p> <p>15 in that mixture?</p> <p>16 A Well, let's see what he did in this particular</p> <p>17 case.</p> <p>18 I believe it's the same mixture he was</p> <p>19 referring earlier.</p> <p>20 Q The activated carbon and the polyurethane?</p> <p>21 A Well, in this particular case he actually</p> <p>22 produces a membrane of a mil thickness and then</p> <p>23 he casts an additional mixture over the top and</p> <p>24 cures and dries it. So that mixture contains</p> <p>25 the active layer in the second case when he's</p>

<p style="text-align: right;">Page 182</p> <p>1 doing the drawdown over the top of the produced</p> <p>2 membrane. What's in the original membrane</p> <p>3 in -- if we're still talking about the same</p> <p>4 example, would have to be the urethane and the</p> <p>5 protected carbon.</p> <p>6 <b>Q So what's your understanding of what's being</b></p> <p>7 <b>done here?</b></p> <p>8 <b>A</b> I think what he's trying to do is produce a two</p> <p>9 layer structure. So he's producing a cured</p> <p>10 base layer of approximately 1 mil in thickness.</p> <p>11 Over the top of that he's using a drawdown bar,</p> <p>12 space it 1 mil, where he applies a layer, cures</p> <p>13 it and it shrinks because it evaporates and</p> <p>14 cures. So he has essentially then a two layer</p> <p>15 structure.</p> <p>16 <b>Q But does he say anywhere in here that it's a</b></p> <p>17 <b>two layer structure?</b></p> <p>18 <b>A</b> Does he say that he produces a two layer</p> <p>19 structure specifically in that example?</p> <p>20 <b>MR. SONG:</b> I'm sorry to</p> <p>21 interrupt. For clarification, are you</p> <p>22 referring to the specific example 1 or the</p> <p>23 entire document?</p> <p>24 <b>MR. GERGELY:</b> I'm referring</p> <p>25 to what we're looking at, lines 14 through,</p>	<p style="text-align: right;">Page 184</p> <p>1 laying down a base of polyurethane and</p> <p>2 activated carbon and surfactant and then</p> <p>3 putting another layer of polyurethane activated</p> <p>4 carbon and surfactant on top of that?</p> <p>5 <b>A</b> That was my understanding.</p> <p>6 <b>Q Could one also read this as creating a single</b></p> <p>7 <b>layer simply comprised of polyurethane and</b></p> <p>8 <b>activated carbon?</b></p> <p>9 <b>MR. SONG:</b> Objection.</p> <p>10 Calls for speculation. Lacks foundation.</p> <p>11 <b>A</b> Not if it's done in a two-step process.</p> <p>12 <b>Q So let's go with your assumption that this is a</b></p> <p>13 <b>two layer membrane.</b></p> <p>14 <b>Lines 14 through 18 states that the</b></p> <p>15 <b>membrane is 1 mil thick, correct?</b></p> <p>16 <b>A</b> Yes. Yes.</p> <p>17 <b>Q And then if there is a second layer being</b></p> <p>18 <b>created with a 1 mil drawdown rod on top of</b></p> <p>19 <b>that, the bottom layer would be 1 mil thick and</b></p> <p>20 <b>the top layer would be 1 mil thick, correct?</b></p> <p>21 <b>A</b> No. The top layer would be thinner than that</p> <p>22 because his finished dimension in the first</p> <p>23 layer would be 1 mil thick. He cites that.</p> <p>24 In the second layer using a 1 mil</p> <p>25 drawdown, you create a 1 mil uncured layer</p>
<p style="text-align: right;">Page 183</p> <p>1 say, 33.</p> <p>2 <b>A</b> He doesn't specifically say he creates a two</p> <p>3 layer structure here. My presumption is he's</p> <p>4 attempting to follow the diagram at some point</p> <p>5 here in Figure 1, which shows the construction</p> <p>6 of the two layer product.</p> <p>7 <b>Q Do you know that?</b></p> <p>8 <b>A</b> With respect to?</p> <p>9 <b>Q Back up to column 9, you said that on lines 14</b></p> <p>10 <b>through 18 your assumption was that that</b></p> <p>11 <b>membrane was the polyurethane plus the</b></p> <p>12 <b>activated carbon, correct?</b></p> <p>13 <b>MR. SONG:</b> Objection.</p> <p>14 Mischaracterizes the witness' testimony. Vague</p> <p>15 as to "assumption."</p> <p>16 <b>Q Well, it says, "drawing down the mixture on</b></p> <p>17 <b>release paper."</b></p> <p>18 <b>Do you see that?</b></p> <p>19 <b>A</b> Yes.</p> <p>20 <b>Q Is there any other mixture in here besides</b></p> <p>21 <b>polyurethane and activated carbon?</b></p> <p>22 <b>A</b> No. The polyurethane, the carbon, and the</p> <p>23 protective surfactant is the mixture that he</p> <p>24 continues to refer to in example 1.</p> <p>25 <b>Q Okay. So is it your contention that he's</b></p>	<p style="text-align: right;">Page 185</p> <p>1 which is then going to shrink in thickness once</p> <p>2 it's cured and any volatile materials are</p> <p>3 driven off. So the thickness is going to be</p> <p>4 less than 1 mil, the second layer. Simply</p> <p>5 because of the mechanics and drawing it down to</p> <p>6 1 mil, that creates the initial precured</p> <p>7 thickness.</p> <p>8 I used to do this all the time in making</p> <p>9 drawdowns. When you heat up the films and cure</p> <p>10 it, it shrinks.</p> <p>11 <b>Q So how much would it shrink?</b></p> <p>12 <b>A</b> Well, it's --</p> <p>13 <b>MR. SONG:</b> Objection.</p> <p>14 Vague as to "how much." Calls for speculation.</p> <p>15 Lack of foundation.</p> <p>16 <b>Q Is it disclosed in this document how much it</b></p> <p>17 <b>shrinks?</b></p> <p>18 <b>A</b> It doesn't tell you specifically how much it</p> <p>19 shrinks, but it's reasonable to assume that</p> <p>20 it's going to shrink so that it fits within</p> <p>21 these parameters of two and a half to 10 with</p> <p>22 respect to the ratios of the two layers.</p> <p>23 You're going to get significant shrinkage</p> <p>24 when you get that evaporative loss. It doesn't</p> <p>25 specifically measure it, but it's a reasonable</p>

<p style="text-align: right;">Page 186</p> <p>1 conclusion to come to that that's his final</p> <p>2 product outcome.</p> <p>3 <b>Q But he doesn't say that in this document,</b></p> <p>4 <b>correct?</b></p> <p>5 A He doesn't --</p> <p>6 MR. SONG: Objection.</p> <p>7 Mischaracterizes the witness' testimony. Lacks</p> <p>8 foundation.</p> <p>9 A He doesn't specifically measure it, but it's --</p> <p>10 within reason you know it's certainly going to</p> <p>11 be thinner. And to the degree it shrinks, I</p> <p>12 think it's a reasonable assumption, given the</p> <p>13 components, that it's going to be a product</p> <p>14 that satisfies his two and a half to one order</p> <p>15 of magnitude construction.</p> <p>16 <b>Q Based on what?</b></p> <p>17 MR. SONG: Objection.</p> <p>18 That's beyond the scope of the witness'</p> <p>19 testimony. I'll instruct him not to answer.</p> <p>20 MR. GERGELY: He was just</p> <p>21 offering this up. I'm just following up with</p> <p>22 him.</p> <p>23 MR. SONG: I'm going to</p> <p>24 instruct the witness not to answer. It's</p> <p>25 outside the scope.</p>	<p style="text-align: right;">Page 188</p> <p>1 that. I think that's inappropriate.</p> <p>2 MR. SONG: Dr. Daniels is</p> <p>3 opining solely on example 1 during your line of</p> <p>4 questioning. You're trying to expand that into</p> <p>5 more generality that his declaration simply</p> <p>6 does not touch. So this line of questioning is</p> <p>7 going to fall outside the scope.</p> <p>8 MR. GERGELY: Well, actually,</p> <p>9 I'm asking him specifically about example 1.</p> <p>10 He said that he believes that it would meet the</p> <p>11 claim limitations. So I'm asking him based on</p> <p>12 what.</p> <p>13 MR. SONG: He's telling</p> <p>14 you that based on his -- based on his</p> <p>15 experience as a POSITA, once that curing and</p> <p>16 drying is done, in example 1, it will fall</p> <p>17 within that range.</p> <p>18 MR. GERGELY: I'm asking him</p> <p>19 based on what.</p> <p>20 MR. SONG: I'm going to</p> <p>21 instruct him not to answer. Anything beyond</p> <p>22 that -- anything beyond him opining on example</p> <p>23 1 is going to fall outside the scope of his</p> <p>24 testimony.</p> <p>25 <b>Q Well, let me ask you this: How can I test the</b></p>
<p style="text-align: right;">Page 187</p> <p>1 MR. GERGELY: That's</p> <p>2 improper. You're instructing him not to</p> <p>3 answer?</p> <p>4 MR. SONG: I'm instructing</p> <p>5 him not to answer at this point. He testified</p> <p>6 as to example 1. He was not retained to opine</p> <p>7 on those specific ratios. So this line of</p> <p>8 questions falls outside the scope of</p> <p>9 permissible testimony under the applicable</p> <p>10 rules.</p> <p>11 MR. GERGELY: All right. I</p> <p>12 guess you proceed at your own risk by doing</p> <p>13 that.</p> <p>14 MR. SONG: Very well,</p> <p>15 Counsel.</p> <p>16 I'm sorry to interrupt. If you would</p> <p>17 like to call the board, that's fine, and if</p> <p>18 we're unable to contact the board, just due to</p> <p>19 the time and the day, in the event our</p> <p>20 objection gets overruled, we'll certainly make</p> <p>21 him available subsequent, but currently I'm</p> <p>22 instructing him not to answer.</p> <p>23 MR. GERGELY: Well, he</p> <p>24 offered up his opinion on what these columns</p> <p>25 mean and now you're trying to shut him down on</p>	<p style="text-align: right;">Page 189</p> <p>1 <b>veracity of what you're saying?</b></p> <p>2 MR. SONG: Objection.</p> <p>3 That's argumentative. I instruct the witness</p> <p>4 not to answer that.</p> <p>5 MR. GERGELY: That's not</p> <p>6 argumentative.</p> <p>7 <b>Q How do I test the veracity of what you just</b></p> <p>8 <b>said in terms of documentary evidence?</b></p> <p>9 MR. SONG: Objection,</p> <p>10 asked and answered. As a POSITA, the witness</p> <p>11 has already answered the question.</p> <p>12 MR. GERGELY: All right.</p> <p>13 Let's call the board.</p> <p>14 It's your objection. It's your</p> <p>15 instruction not to answer. This is your deal.</p> <p>16 You have to call the board and get them to</p> <p>17 agree with you to stop the deposition.</p> <p>18 I'll remind you that under board practice</p> <p>19 the only way you can tell a witness not to</p> <p>20 answer is for privilege.</p> <p>21 MR. SONG: And when the</p> <p>22 scope of testimony -- or scope of the</p> <p>23 examination falls outside of direct.</p> <p>24 MR. GERGELY: All right. So</p> <p>25 call the board and let's see if they agree with</p>

<p style="text-align: right;">Page 190</p> <p>1 you.</p> <p>2 - - - - -</p> <p>3 (Off the record.)</p> <p>4 - - - - -</p> <p>5 MR. SONG: So if we don't</p> <p>6 go down this line of questioning and we're not</p> <p>7 able to get on the phone with the board today,</p> <p>8 when we are able to get on the phone with the</p> <p>9 board, in the event that they deny the request</p> <p>10 to limit the testimony as I'm instructing the</p> <p>11 witness, we will agree to reproduce</p> <p>12 Mr. Daniels.</p> <p>13 MR. GERGELY: Right. So are</p> <p>14 you going to pay for my air travel, my time, my</p> <p>15 hotel, and all of my other out-of-pocket</p> <p>16 expenses that are incurred as a result of this?</p> <p>17 MR. SONG: No, we're not</p> <p>18 saying that. We will agree to reproduce the</p> <p>19 witness, though, in the event that our request</p> <p>20 is denied.</p> <p>21 MR. GERGELY: Well, thanks,</p> <p>22 but I don't necessarily agree to your offer</p> <p>23 because, you know, given the time frames that</p> <p>24 we're working under, I would suggest that you</p> <p>25 simply allow the witness to answer the question</p>	<p style="text-align: right;">Page 192</p> <p>1 Q Well, let me ask you this: Do you know when it</p> <p>2 was made?</p> <p>3 A I don't know when it was made.</p> <p>4 Q Do you know who made it?</p> <p>5 A I believe in Dr. Haggquist's second declaration</p> <p>6 he said he did.</p> <p>7 Q Do you know how he stored it?</p> <p>8 A I do not.</p> <p>9 Q Would that be important to you?</p> <p>10 MR. SONG: Objection,</p> <p>11 vague and ambiguous as to "important."</p> <p>12 A Well, to the extent we tested it, the first</p> <p>13 thing we did -- I did was make sure that they</p> <p>14 were in the original wrapping or packaging. I</p> <p>15 didn't see any damage, so my assumption was</p> <p>16 that between the time they were shipped and by</p> <p>17 the time I got them, nothing had changed in</p> <p>18 them.</p> <p>19 The kinds of properties we were going to</p> <p>20 measure, if there was any kind of substantive</p> <p>21 damage or substantive change, it would have</p> <p>22 been visible under the microscope. We didn't</p> <p>23 see any. So clearly it's important, but we try</p> <p>24 to verify independently that nothing had</p> <p>25 happened.</p>
<p style="text-align: right;">Page 191</p> <p>1 subject to objections and if you think it went</p> <p>2 beyond the scope, you can certainly move to</p> <p>3 strike. That seems like a much more reasonable</p> <p>4 approach, rather than dragging the witness and</p> <p>5 myself back to Cleveland for what will amount</p> <p>6 to be 15 more minutes of questioning.</p> <p>7 MR. SONG: All right.</p> <p>8 Counsel, your comment is noted.</p> <p>9 Can we break briefly?</p> <p>10 MR. GERGELY: Sure.</p> <p>11 - - - - -</p> <p>12 (Recess taken.)</p> <p>13 - - - - -</p> <p>14 BY MR. GERGELY:</p> <p>15 Q Now, sir, I understand you did some technical</p> <p>16 analysis in this case --</p> <p>17 A Yes.</p> <p>18 Q -- of sample products.</p> <p>19 The first material was called "TNF</p> <p>20 Laminate Our Print"?</p> <p>21 A Yes.</p> <p>22 Q Do you know anything about the chain of custody</p> <p>23 of that material?</p> <p>24 MR. SONG: Objection.</p> <p>25 "Chain of custody" is a legal conclusion.</p>	<p style="text-align: right;">Page 193</p> <p>1 Q Dr. Haggquist testified in his deposition that</p> <p>2 he believed that this print was made somewhere</p> <p>3 between the time of the provisional patent</p> <p>4 application and sometime in the 2011 or 2012</p> <p>5 time frame.</p> <p>6 Assuming this material is six to seven</p> <p>7 years old, do you have any concerns about</p> <p>8 whether it degraded over time?</p> <p>9 MR. SONG: Objection. It</p> <p>10 assumes facts not in evidence. Vague and</p> <p>11 ambiguous as to "concerns."</p> <p>12 You can answer.</p> <p>13 A Okay. Obviously that's important. And so what</p> <p>14 would you do to assure yourself that there</p> <p>15 wasn't anything in the way of degradation or</p> <p>16 otherwise changing of the integrity of the</p> <p>17 material?</p> <p>18 You would look for the presence of small</p> <p>19 cracks, water damage, or any of those kinds of</p> <p>20 things. It would be very apparent when you put</p> <p>21 it under the microscope of a magnification. We</p> <p>22 didn't see any of that, so I felt confident</p> <p>23 that we were looking at something that was</p> <p>24 stable and undamaged.</p> <p>25 Q In paragraph 111 you say, "Based on my analysis</p>

<p style="text-align: right;">Page 194</p> <p>1 as well as other information provided to me and</p> <p>2 my years of experience with materials analysis</p> <p>3 and elemental analysis, it is my opinion that</p> <p>4 both samples practice Claim 27 of the '287</p> <p>5 Patent."</p> <p>6 Do you see that?</p> <p>7 A Yes.</p> <p>8 Q Did you do anything to verify the thicknesses</p> <p>9 of the layers?</p> <p>10 A No. We couldn't do that, but as I said in</p> <p>11 Dr. Haggquist's second declaration, he asserted</p> <p>12 that the thickness is met in the specification</p> <p>13 of the '287 patent. And also the moisture</p> <p>14 vapor transmission specification. We didn't</p> <p>15 run that test independently. We relied upon</p> <p>16 Dr. Haggquist's data which suggested that it</p> <p>17 did.</p> <p>18 Our objective here was to try to</p> <p>19 determine the chemical and physical composition</p> <p>20 of the layer structures and address that point.</p> <p>21 The rest of those kinds of experiment were</p> <p>22 really more difficult to do and outside the</p> <p>23 capability and actually the intent of our</p> <p>24 testing in total.</p> <p>25 Q It would have been relatively easy to take a</p>	<p style="text-align: right;">Page 196</p> <p>1 A No, we could not do that.</p> <p>2 Q Looking over at paragraph 115, you say that "I</p> <p>3 was able to see the particles of the pattern</p> <p>4 from the active layer (the print layer) on the</p> <p>5 fabric piece."</p> <p>6 A Yes. Yes.</p> <p>7 Q Help me out here. What is a particle here?</p> <p>8 Could you point out a particle for me?</p> <p>9 A Yeah. What you're looking at is this dot or</p> <p>10 pattern of particles in figure -- the figure</p> <p>11 that just comes after paragraph 115.</p> <p>12 So if you look very closely, you'll see</p> <p>13 small structures, large structures, individual</p> <p>14 structures, agglomerates of structures.</p> <p>15 So what we attempted to do was to see if</p> <p>16 we could see independent particles. And you</p> <p>17 could see some off to the left there in white</p> <p>18 that are stuck on the surfaces of these much</p> <p>19 larger structures.</p> <p>20 And that particular micrograph shows</p> <p>21 individual particles and you can also see these</p> <p>22 black areas that are holes. I'm pointing to</p> <p>23 it. I don't know if I'm helping you. But</p> <p>24 these definitely represent pores, the lack of</p> <p>25 solid material in them.</p>
<p style="text-align: right;">Page 195</p> <p>1 cross section of this material and measure the</p> <p>2 layers, wouldn't it?</p> <p>3 MR. SONG: Objection.</p> <p>4 Vague as to "relatively easy." Incomplete</p> <p>5 hypothetical. Assumes facts not in evidence.</p> <p>6 You can answer.</p> <p>7 THE WITNESS: Thank you.</p> <p>8 A We actually tried to do that. Unfortunately</p> <p>9 what happens is in a microscope when you take a</p> <p>10 sharp edge and try to cut it, there's a couple</p> <p>11 things that happen. It's particularly as a</p> <p>12 result of the fabric to which it's adhered.</p> <p>13 That tends to fray. It tends to interfere with</p> <p>14 your ability to support the fabric and look at</p> <p>15 it on edge.</p> <p>16 I, like you, thought it would be easy to</p> <p>17 do. Our attempts to do it, we couldn't discern</p> <p>18 the existence of layers. In fact, we couldn't</p> <p>19 get enough definition to really be able to do</p> <p>20 that.</p> <p>21 So it was obviously a system that was</p> <p>22 going to take some much more elegant kinds of</p> <p>23 sectioning to be able to do that.</p> <p>24 Q So you were not able to independently verify</p> <p>25 that the thickness ratios was met?</p>	<p style="text-align: right;">Page 197</p> <p>1 Q So anything that shows up on this micrograph as</p> <p>2 gray or black you would say is a pore?</p> <p>3 A They look to be pores in the overall structure.</p> <p>4 If we go to some later photographs, you'll see,</p> <p>5 particularly the one at the bottom of page 52.</p> <p>6 We're looking at a dot, but here we're look at</p> <p>7 it at a lower magnification. And it's pretty</p> <p>8 clear that that dot, which appears as sort of</p> <p>9 that structure in the center, has within it a</p> <p>10 group of smaller particles and within those are</p> <p>11 these pores or holes.</p> <p>12 Q I see some white dots, but I don't see any</p> <p>13 pores.</p> <p>14 Where would the pores be?</p> <p>15 A Right in here. Right in here. The things that</p> <p>16 look more black than the surrounding field.</p> <p>17 Q Oh. Could those just be spaces between the</p> <p>18 particles?</p> <p>19 A Probably not, because in a number of these</p> <p>20 cases you'll see it's surrounded by the other</p> <p>21 material. If you look very closely, you'll see</p> <p>22 that there's material around those dots, around</p> <p>23 those pores, around those holes. And so they</p> <p>24 are more than likely pores within a given</p> <p>25 series of particles.</p>

<p style="text-align: right;">Page 198</p> <p>1 Q And then back to the high-res micrograph on 51.</p> <p>2 A Yeah. Same thing.</p> <p>3 Q Could you point out the scale? I don't</p> <p>4 understand the scale. Is 20 microns each hash</p> <p>5 mark?</p> <p>6 A 20 microns is each hash mark.</p> <p>7 Q Okay.</p> <p>8 A So you got structures in there that range from</p> <p>9 just under 20, maybe half that, to on up from</p> <p>10 there as they appear as clusters of particles.</p> <p>11 Q I see what you're describing as clusters, but I</p> <p>12 don't see the individual pores.</p> <p>13 A Well, let's look at -- maybe if I come around</p> <p>14 it might be easier for you.</p> <p>15 Q Yeah.</p> <p>16 A In here.</p> <p>17 Q You would say that those are pores?</p> <p>18 A Uh-huh.</p> <p>19 Q Okay.</p> <p>20 A This looks like one because it's surrounded by</p> <p>21 a solid material. It's not the result of</p> <p>22 boundaries of materials.</p> <p>23 Q Okay. Well, I guess what I'm asking is: How</p> <p>24 do you know that this solid material isn't just</p> <p>25 an agglomeration of particles?</p>	<p style="text-align: right;">Page 200</p> <p>1 And then if you will look at the</p> <p>2 secondary ion spectrometry, which we call</p> <p>3 energy dispersive x-ray spectrometry, in each</p> <p>4 one of those peaks that you see on the figure</p> <p>5 on page 55 represents certain types of x-ray</p> <p>6 absorptions and relaxations, excitations that</p> <p>7 correspond to elements that you can identify.</p> <p>8 And then below, although it's very hard</p> <p>9 to see, you can actually look at the map. So</p> <p>10 the yellow, for example, might be a location of</p> <p>11 the carbon line, but we call it the K-alpha</p> <p>12 absorption area.</p> <p>13 So you could look across the particles</p> <p>14 and tell where the elements are. You could</p> <p>15 tell grossly what the elements are comprised of</p> <p>16 by looking at the spectrum. So we did both</p> <p>17 experiments.</p> <p>18 Q So I notice there's a bunch of different</p> <p>19 elements in here.</p> <p>20 A Yes.</p> <p>21 Q There's it looks like titanium, calcium,</p> <p>22 platinum?</p> <p>23 A Yeah. The platinum is kind of a ringer,</p> <p>24 because the platinum many times is used as a</p> <p>25 coating on these samples. So it's an artifact</p>
<p style="text-align: right;">Page 199</p> <p>1 A It could very well be, but within that</p> <p>2 agglomeration of materials you're still going</p> <p>3 to have pores at the surface.</p> <p>4 Q But you pointed out a specific example as being</p> <p>5 a pore, and I said, "How would you know that's</p> <p>6 not a space between the agglomerate?"</p> <p>7 A You would see more of the boundary of the</p> <p>8 particles.</p> <p>9 This looks like a boundary of a particle</p> <p>10 right in here. That looks like two things</p> <p>11 stuck together. Two particles adhered</p> <p>12 together. So that one with a curved shape</p> <p>13 looks like a boundary. That looks like it's</p> <p>14 right in the particle itself.</p> <p>15 Q Okay.</p> <p>16 A So that's how we differentiate it.</p> <p>17 MR. SONG: That's probably</p> <p>18 not going to show up great on the transcript.</p> <p>19 THE WITNESS: Yeah.</p> <p>20 Q You did some spectroscopy with respect to the</p> <p>21 samples?</p> <p>22 A We did some elemental spectroscopy. And in</p> <p>23 that particular case, it's pretty easy to do</p> <p>24 when it's in the SEM because you can simply</p> <p>25 focus in on a given area.</p>	<p style="text-align: right;">Page 201</p> <p>1 of remaining experiments, it's not real.</p> <p>2 But there's a large carbon line which is</p> <p>3 way off to the left, that pink sort of carbon</p> <p>4 symbol. And then you have oxygen, you have</p> <p>5 sodium, aluminum, silicon, phosphorus, a few</p> <p>6 other things.</p> <p>7 Q What is sodium and magnesium attributable to?</p> <p>8 A Well, you've probably got a couple of things.</p> <p>9 You notice that the -- from the elemental</p> <p>10 composition -- I didn't know this out a priori</p> <p>11 but I found out later in Haggquist's second</p> <p>12 deposition -- or second declaration, rather,</p> <p>13 that these particles consisted both of</p> <p>14 activated carbon, as well as a zeolite.</p> <p>15 So these materials are consistent with</p> <p>16 what you would find in zeolite, as well as in</p> <p>17 an activated carbon.</p> <p>18 The other part of this is it is so</p> <p>19 sensitive. If there's any impurities, because</p> <p>20 these things are, particularly the zeolite, a</p> <p>21 natural material, you're going to pick up other</p> <p>22 things. They're all consistent with minerals</p> <p>23 of that type, plus the activated carbon.</p> <p>24 Q There's oxygen in there as well?</p> <p>25 A Right.</p>

<p style="text-align: right;">Page 202</p> <p>1 Q What is that attributable to?</p> <p>2 A Well, the zeolite has oxygen in it. It's also</p> <p>3 possible there may be some oxidized surfaces in</p> <p>4 the carbon particle. So they actually emanate</p> <p>5 from two potential sources.</p> <p>6 Q Are there any other sources that oxygen would</p> <p>7 be attributable to?</p> <p>8 A It's possible that there may be some other</p> <p>9 contaminants in there that contain some</p> <p>10 oxygens, but I think that's the primary source.</p> <p>11 Just to be clear, this is done in a</p> <p>12 vacuum. So it's not oxygen from the air.</p> <p>13 Q Okay. What about if some water got on the</p> <p>14 sample?</p> <p>15 A It would be gone. This is under high vacuum.</p> <p>16 So the chances of any water remaining would be</p> <p>17 extremely slight.</p> <p>18 Q Did you handle the material with gloves?</p> <p>19 A The analysts did. We tried to stay away from</p> <p>20 handling anything that had to do with a</p> <p>21 particular area. Pick it up with the edges.</p> <p>22 And then when you make your sections, you try</p> <p>23 not to contaminate it, yes.</p> <p>24 Q What would sulfur and calcium be attributable</p> <p>25 to?</p>	<p style="text-align: right;">Page 204</p> <p>1 Again it's the computer playing tricks on you.</p> <p>2 Q Did you explain the sodium?</p> <p>3 A That's also very small. Sodium is everywhere.</p> <p>4 It's almost hard to find a sample that doesn't</p> <p>5 have some in it.</p> <p>6 Q Could it be salt if someone had handled this</p> <p>7 with their hands at some point in time?</p> <p>8 A Well, if someone did, yes. But that didn't</p> <p>9 happen. It was always done with some extreme</p> <p>10 cares to not contaminate the surface.</p> <p>11 Q Right. But were you able to verify whether</p> <p>12 other people before had handled it with their</p> <p>13 hands?</p> <p>14 A Did not.</p> <p>15 Q You did the same testing with respect to the</p> <p>16 sample called TNF jacket?</p> <p>17 A Yes.</p> <p>18 Q Do you know when that was made and who made it?</p> <p>19 A I don't. I relied upon samples from</p> <p>20 Dr. Haggquist.</p> <p>21 Q Same question. Were you able to verify the</p> <p>22 thicknesses of the layers or what the ratios</p> <p>23 were?</p> <p>24 A Same issue. No, we couldn't. We would have</p> <p>25 liked to have, but we were unable to do so.</p>
<p style="text-align: right;">Page 203</p> <p>1 A Good questions. They're probably, as I say,</p> <p>2 trace contamination of the sample. The calcium</p> <p>3 peak is very low. So it's hardly there at all.</p> <p>4 I'm not certain where the sulfur would</p> <p>5 come from, unless it was an acid treated</p> <p>6 activated carbon with some residues that was,</p> <p>7 you know, sulfur from sulfuric acid. But</p> <p>8 that's pure speculation. I don't want to go</p> <p>9 there.</p> <p>10 Q What about phosphorus?</p> <p>11 A That's so small. It's the computer playing</p> <p>12 tricks on you. It's almost not there as at.</p> <p>13 Q What about silicon?</p> <p>14 A Well, the silicon of course you would expect</p> <p>15 from any silicates. So if they were present,</p> <p>16 if there's any kind of silicate contamination,</p> <p>17 it would also be present.</p> <p>18 Q What would cause silicate contamination?</p> <p>19 A Well, your zeolite material, if I'm not</p> <p>20 mistaken, contains some silicon as well. So</p> <p>21 it's possible that that's bound in the zeolite</p> <p>22 material. Where else would it come from?</p> <p>23 Don't know.</p> <p>24 Q What about the chlorine?</p> <p>25 A The chlorine. Oh, my God. That is so small.</p>	<p style="text-align: right;">Page 205</p> <p>1 Q Did you consider sending it out to another lab</p> <p>2 for testing?</p> <p>3 A We did not.</p> <p>4 Q You said you also reviewed TNF's DryVent</p> <p>5 products claim chart?</p> <p>6 A Yes.</p> <p>7 Q Did you actually review any TNF DryVent</p> <p>8 products that are actually accused of</p> <p>9 infringement?</p> <p>10 A You mean this way?</p> <p>11 Q Yeah, correct. With lab testing.</p> <p>12 You looked at the chart?</p> <p>13 A Yeah.</p> <p>14 Q Okay. Have you looked at Dr. Haggquist's</p> <p>15 inventor notebooks in this case?</p> <p>16 A His actual notebooks?</p> <p>17 Q Right.</p> <p>18 A No.</p> <p>19 MR. SONG: I'm getting a</p> <p>20 phone call.</p> <p>21 - - - - -</p> <p>22 (Telephone call.)</p> <p>23 - - - - -</p> <p>24 (Off the record.)</p> <p>25 - - - - -</p>


<p style="text-align: right;">Page 206</p> <p>1 BY MR. GERGELY:</p> <p>2 Q Well, why don't we go back to that line of</p> <p>3 questioning.</p> <p>4 MR. GERGELY: Are we back on?</p> <p>5 Q So, sir, I would like to draw your attention</p> <p>6 back to the Haggquist '287 patent, which is</p> <p>7 marked as Daniels 10.</p> <p>8 I understand you're stating that you</p> <p>9 believed -- I was asking you questions about</p> <p>10 how the bottom membrane would be 1 mil thick</p> <p>11 and then the membrane on the top would be cast</p> <p>12 1 mil thick and I was asking you about the</p> <p>13 ratios, and then you suggested that there was</p> <p>14 going to be some shrinkage with respect to the</p> <p>15 second layer. I was asking you to try to</p> <p>16 characterize what that level of shrinkage would</p> <p>17 be.</p> <p>18 Are you able to do that?</p> <p>19 A Yes. I believe I said that it would shrink and</p> <p>20 the degree of shrinkage in my testimony was</p> <p>21 that it would likely fall in the range of two</p> <p>22 and a half to 10.</p> <p>23 Q I think where we got sideways with objections,</p> <p>24 I asked you based on what?</p> <p>25 A Yeah.</p>	<p style="text-align: right;">Page 208</p> <p>1 would not have done.</p> <p>2 MR. GERGELY: You know,</p> <p>3 Counsel, there's been lot of speaking</p> <p>4 objections all day and I've been quiet about</p> <p>5 them, but what you're doing by these repeated</p> <p>6 objections is really going over the line and</p> <p>7 I'd ask you to stop and just -- there's a very</p> <p>8 limited set of objections you can make under</p> <p>9 the board's rules and practices. So I would</p> <p>10 ask you just to limit your objections.</p> <p>11 I understand your objections.</p> <p>12 Q Let me try to make it clear to you.</p> <p>13 Do you understand what calipers are?</p> <p>14 A I do.</p> <p>15 Q Okay. Do you understand that calipers can be</p> <p>16 used to measure the thickness of a membrane?</p> <p>17 A I would not do it with the calipers at this</p> <p>18 thickness, I would choose some other method</p> <p>19 because 1 mil is awfully thin.</p> <p>20 Q What would you do?</p> <p>21 A You would try to do it with a microscope. You</p> <p>22 would try to do it -- casting it on some sort</p> <p>23 of a substrate, like a glass slide, for</p> <p>24 example, put it on edge.</p> <p>25 And assuming you could get contrast, and</p>
<p style="text-align: right;">Page 207</p> <p>1 Q What do you base that opinion on?</p> <p>2 A The answer's quite simple. It's based on</p> <p>3 experience.</p> <p>4 Q How can I test the veracity of what you're</p> <p>5 saying?</p> <p>6 MR. SONG: I'll interpose</p> <p>7 an objection. It's outside the scope of the</p> <p>8 witness' direct testimony. It calls for</p> <p>9 improper testimony on section 112, issues that</p> <p>10 are outside the scope of these proceedings.</p> <p>11 Q You can answer.</p> <p>12 MR. SONG: You can answer.</p> <p>13 A Okay. I mean, the most direct method obviously</p> <p>14 would be to create that mixture, condition it</p> <p>15 under the temperatures shown, do a 1 mil</p> <p>16 drawdown, and cure it under the conditions and</p> <p>17 measure it.</p> <p>18 Q Now, wouldn't it have also been very simple for</p> <p>19 the inventor to have measured what you contend</p> <p>20 is a two layer structure with a set of</p> <p>21 calipers?</p> <p>22 MR. SONG: Objection.</p> <p>23 Vague and argumentative as to the term</p> <p>24 "simple." Calls for speculation as to what the</p> <p>25 inventor could or could not have or would or</p>	<p style="text-align: right;">Page 209</p> <p>1 I don't know the answer to whether or not you</p> <p>2 can, but assuming you could, then with a</p> <p>3 calibrated set of automatic microscope</p> <p>4 equipment, which many labs have, that could be</p> <p>5 done.</p> <p>6 Q Okay. So there is an ability to measure what</p> <p>7 those purported two layers would be, correct?</p> <p>8 A Yes. Particularly in the way that this</p> <p>9 experiment was described, there's no substrate</p> <p>10 nylon. So take that out of the mix so we don't</p> <p>11 have all of that frame going on. You would</p> <p>12 have to do it in a set of ideal conditions so</p> <p>13 that you know what you're dealing with and</p> <p>14 measure 1 mil at the start and then proceed</p> <p>15 through the process.</p> <p>16 Q Regardless, the inventor didn't report here</p> <p>17 what those final dimensions were, did he?</p> <p>18 A It's not shown in that paragraph, no.</p> <p>19 - - - - -</p> <p>20 (Petitioner's Exhibit Daniels 17 was marked.)</p> <p>21 - - - - -</p> <p>22 Q Why don't we go back to the infringement</p> <p>23 contentions, which was labeled Haggquist 14 and</p> <p>24 now we've also labeled it Daniels 17.</p> <p>25 A Got it. Thank you.</p>

<p style="text-align: right;">Page 210</p> <p>1 Q You've reviewed these, correct?</p> <p>2 A Yes.</p> <p>3 Q I seem to have lost my copy.</p> <p>4 MR. GERGELY: Let's just go</p> <p>5 off the record for a second.</p> <p>6 - - - - -</p> <p>7 (Off the record.)</p> <p>8 - - - - -</p> <p>9 BY MR. GERGELY:</p> <p>10 Q Now, sir, drawing your attention to Daniels 17,</p> <p>11 I'd like to draw your attention to the AA, the</p> <p>12 Analytical Answers report.</p> <p>13 A Which is the one in the back?</p> <p>14 Q Yeah, there's numbers at the bottom. It says</p> <p>15 20 of 93.</p> <p>16 A 20 of 93. 20 of 93.</p> <p>17 Q It's this page.</p> <p>18 A Got it. It's the back side of this one.</p> <p>19 Q So you reviewed this report?</p> <p>20 A Briefly I did, yes.</p> <p>21 Q Do you see in the conclusions where it states</p> <p>22 "The North Face ink layer contained silicon</p> <p>23 based particles (presumably oxide), but these</p> <p>24 were very primarily very fine particles (tens</p> <p>25 of nanometers in diameter)"?</p>	<p style="text-align: right;">Page 212</p> <p>1 small to be activated?</p> <p>2 A No, I didn't say that. I just said that I have</p> <p>3 not studied the Black Pearls 2000 behavior to</p> <p>4 be able to tell you one way or the other,</p> <p>5 independently from what's been published, in</p> <p>6 terms of its ability to be activated.</p> <p>7 Q And then above with respect to the "silicon</p> <p>8 based particles (presumably oxide)."</p> <p>9 A Yes.</p> <p>10 Q Were you able to verify whether those were</p> <p>11 silicon dioxide or not?</p> <p>12 A In our analysis?</p> <p>13 Q Yeah.</p> <p>14 A No.</p> <p>15 Q And then their author says, "these were</p> <p>16 primarily very fine particles (tens of</p> <p>17 nanometers in diameter)."</p> <p>18 Do you see that?</p> <p>19 A I do.</p> <p>20 Q Given the fact that the silicon-based particles</p> <p>21 of an unknown origin and the carbon particles</p> <p>22 less than 5 nanometers, did that raise a</p> <p>23 question in your mind as to whether the North</p> <p>24 Face product was actually using activated</p> <p>25 particles?</p>
<p style="text-align: right;">Page 211</p> <p>1 A I see that.</p> <p>2 Q Do you see where the author states "We did not</p> <p>3 find any abundance of observable carbon based</p> <p>4 filler particles in the ink layer. This could</p> <p>5 be interpreted as either the samples contained</p> <p>6 particles of a size which could not be resolved</p> <p>7 i.e., less than 5 nanometers in diameter using</p> <p>8 this technique, or that such particles were not</p> <p>9 present"?</p> <p>10 Do you see that?</p> <p>11 A I do.</p> <p>12 Q So is less than 5 nanometers in diameter very</p> <p>13 small?</p> <p>14 A Yes.</p> <p>15 Q Is that on the order of carbon soot?</p> <p>16 A I don't know, but it's very small.</p> <p>17 Q Is that too small to be activated?</p> <p>18 A Again I don't know.</p> <p>19 Q You opine that carbon soot is too small to be</p> <p>20 activated, correct?</p> <p>21 A Yes.</p> <p>22 Q We know that Black Pearls 2000 is about 13</p> <p>23 nanometers, correct?</p> <p>24 A 13.</p> <p>25 Q Do you believe that Black Pearls 2000 is too</p>	<p style="text-align: right;">Page 213</p> <p>1 A In their analysis?</p> <p>2 Q Correct.</p> <p>3 A One of the questions I did not see answered in</p> <p>4 this was -- there are different ways of doing</p> <p>5 the so-called ultra shield emission scanning</p> <p>6 electron microscopy.</p> <p>7 And the question I would have, and I</p> <p>8 didn't see this answered, is whether or not</p> <p>9 they have a detector that's capable of looking</p> <p>10 at particles as small as in atomic size as</p> <p>11 carbon. That's normally -- it's normally</p> <p>12 achieved with newer versions of the</p> <p>13 instrumentation.</p> <p>14 So without seeing any of these being run</p> <p>15 with controls that contain a known carbon, is</p> <p>16 it possible they missed it because they</p> <p>17 couldn't see it, is it possible that it wasn't</p> <p>18 there as they stated, or is it possible that it</p> <p>19 was too small for the beam size they were using</p> <p>20 to be able to get a signal. They didn't answer</p> <p>21 that.</p> <p>22 Q Does that raise a question in your mind as to</p> <p>23 whether or not the particles that are in the</p> <p>24 North Face product are actually activated?</p> <p>25 MR. SONG: Objection,</p>

<p style="text-align: right;">Page 214</p> <p>1 speculation.</p> <p>2 A You can't tell whether or not they're activated</p> <p>3 by these techniques, you can just tell the</p> <p>4 elemental composition.</p> <p>5 Q Okay. In terms of the thicknesses of the</p> <p>6 layers, do you know whether Cocona was</p> <p>7 averaging those thicknesses or whether they</p> <p>8 just picked certain of the measurements?</p> <p>9 A I don't know.</p> <p>10 Q What do you think would be a more fair</p> <p>11 representation, an average or picking a single</p> <p>12 measurement?</p> <p>13 A Well, there's two ways to do it.</p> <p>14 One is to measure one several times to</p> <p>15 determine how accurately you can make the</p> <p>16 measurement.</p> <p>17 And the other method is to measure</p> <p>18 several of them several times and average the</p> <p>19 averages, if you will.</p> <p>20 So in terms of representativeness, you</p> <p>21 like to look at more than one.</p> <p>22 Q I appreciate that.</p> <p>23 In terms of MVTR, did you see any</p> <p>24 analysis of this data with respect to a</p> <p>25 control?</p>	<p style="text-align: right;">Page 216</p> <p>1 That was the application.</p> <p>2 A Yes.</p> <p>3 MR. GERGELY: Just give me a</p> <p>4 second, because I need to find it.</p> <p>5 Got it.</p> <p>6 A Okay.</p> <p>7 Q If you turn to page 3, paragraph 30.</p> <p>8 A Okay.</p> <p>9 Q Review that for a moment.</p> <p>10 So there are a number of compounds I</p> <p>11 guess I'll call them listed in paragraph 30.</p> <p>12 Do you see that, of the last sentence?</p> <p>13 A Yes.</p> <p>14 Q I believe you were talking about some of those</p> <p>15 articles with Mr. Gergely earlier. Zeolites</p> <p>16 and titanium dioxide, for example, right?</p> <p>17 A Yes.</p> <p>18 Q Do you recall that?</p> <p>19 A Yes.</p> <p>20 Q Zeolites in their naturally occurring state,</p> <p>21 are those active? Would you consider those</p> <p>22 active particles?</p> <p>23 A Well, again, depending upon the surface,</p> <p>24 active -- I'm sorry. The surface topography,</p> <p>25 the pores on the surface area, they can be</p>
<p style="text-align: right;">Page 215</p> <p>1 A In this report?</p> <p>2 Q In the infringement claim chart or the report.</p> <p>3 A I don't recall seeing that.</p> <p>4 Q Would you need to compare a sample with the</p> <p>5 challenged material in it versus a control to</p> <p>6 make a determination whether or not there's an</p> <p>7 improved MVTR?</p> <p>8 A You should do that.</p> <p>9 MR. GERGELY: I don't have</p> <p>10 anything further for the witness.</p> <p>11 I appreciate your time, Jacob.</p> <p>12 Dr. Daniels, it was nice meeting you.</p> <p>13 Do you have any redirect?</p> <p>14 MR. SONG: Maybe just a</p> <p>15 few questions. Could I take a few minutes to</p> <p>16 organize?</p> <p>17 MR. GERGELY: Of course.</p> <p>18 - - - - -</p> <p>19 (Recess taken.)</p> <p>20 - - - - -</p> <p>21 MR. SONG: I think I just</p> <p>22 have a handful of questions.</p> <p>23 EXAMINATION OF CHARLES A. DANIELS</p> <p>24 BY MR. SONG:</p> <p>25 Q Dr. Daniels, let's go to exhibit Daniels 4.</p>	<p style="text-align: right;">Page 217</p> <p>1 active in the sense that they will adsorb</p> <p>2 materials just simply based on the fact that</p> <p>3 they're highly porous. But they can be further</p> <p>4 activated, as can others.</p> <p>5 Q When you talk about that further activation,</p> <p>6 how is that accomplished?</p> <p>7 A Well, you would do some surface treatments to</p> <p>8 create a much more chemically modified surface</p> <p>9 such that you could create increased porosity.</p> <p>10 You could change the chemical nature right at</p> <p>11 the surface.</p> <p>12 Q So in terms of the active particles that are</p> <p>13 discussed here in paragraph 30 and by extension</p> <p>14 in the '287 patent, are those active particles</p> <p>15 that have been treated, as you understand it?</p> <p>16 A My understanding is that when somebody says</p> <p>17 it's an active particle, it's been activated.</p> <p>18 So it's been treated.</p> <p>19 Q So, for example, in paragraph 30 when we're</p> <p>20 talking titanium dioxide, we're referring to a</p> <p>21 treated and then activated titanium dioxide?</p> <p>22 A Yes. Maybe I didn't make it clear. Titanium</p> <p>23 dioxide comes with a lot of surface treatments</p> <p>24 for various reasons; making them easier to</p> <p>25 disperse, protecting the surfaces so that they</p>

<p style="text-align: right;">Page 218</p> <p>1 don't slough off, and other versions of them</p> <p>2 that are sold in converse. Some can be</p> <p>3 encapsulated. Some can be surface treated.</p> <p>4 Q I'll have you look at page 15, paragraph 43 of</p> <p>5 Daniels 1, your declaration.</p> <p>6 A Okay. What page again?</p> <p>7 Q 15.</p> <p>8 A 15.</p> <p>9 Q Paragraph 43.</p> <p>10 A Okay.</p> <p>11 Q Have you had a chance to review that?</p> <p>12 A Uh-huh.</p> <p>13 Q So I think the third sentence, it says,</p> <p>14 "Materials such as activated carbon particles</p> <p>15 and porous aluminum oxide can be activated by</p> <p>16 heat and chemical treatment to alter the</p> <p>17 surface chemistry to act as adsorbing species."</p> <p>18 A Yes.</p> <p>19 Q So that heat and chemical treatment, are those</p> <p>20 some of the types of processes that would be</p> <p>21 applied to this list of compounds in paragraph</p> <p>22 30?</p> <p>23 A They're among the processes that can be used.</p> <p>24 These are the typically common ones, heat and</p> <p>25 chemical treatment.</p>	<p style="text-align: right;">Page 220</p> <p>1 Q So the first sentence at the top of that page,</p> <p>2 "A POSITA understands that, in Dutta, the</p> <p>3 hydrophilic particles swell and thereby stretch</p> <p>4 the membrane, creating holes or channels that</p> <p>5 allow water vapor to move across the membrane."</p> <p>6 Are those holes or channels, are those</p> <p>7 between hydrophilic particles, through the</p> <p>8 hydrophilic particles, or both?</p> <p>9 A It could be both. It depends upon the forces</p> <p>10 that are created. Certainly there are going to</p> <p>11 be channels in a molecular level in the</p> <p>12 hydrophilic particles, but depending upon how</p> <p>13 much swelling takes place, you can create</p> <p>14 stresses that would create channels in the</p> <p>15 layer in which they're embedded.</p> <p>16 Q Thank you.</p> <p>17 I'm moving forward a little bit to page</p> <p>18 38. So in paragraph 87, it's your conclusion</p> <p>19 that a person of ordinary skill in the art --</p> <p>20 and I'm reading this verbatim.</p> <p>21 "A person of ordinary skill in the art</p> <p>22 would not be motivated to combine Dutta and</p> <p>23 Haggquist and arrive at the claimed inventions,</p> <p>24 as discussed below, for at least the reasons</p> <p>25 that Dutta actively teaches away from using</p>
<p style="text-align: right;">Page 219</p> <p>1 Q For each of the compounds listed in paragraph</p> <p>2 30 of Daniels 4 --</p> <p>3 A Daniels 4. Yes.</p> <p>4 Q Those would be the activated versions on each</p> <p>5 of those compounds, is that correct, of what's</p> <p>6 being referenced?</p> <p>7 A Yes. All along I believe that when Haggquist</p> <p>8 talks about particles, he's talking about</p> <p>9 activated active particles.</p> <p>10 Q So, for example, if silica gel is referenced,</p> <p>11 it's understood by a person with ordinary skill</p> <p>12 in the art like yourself that it's talking</p> <p>13 about activated silica gel?</p> <p>14 A Yes. And as I've mentioned, there are</p> <p>15 different forms of these materials, some of</p> <p>16 which can be made more active by activation</p> <p>17 than their pedestrian counterparts.</p> <p>18 Q So for the purposes of the '287 patent, those</p> <p>19 compounds that we just discussed are all the</p> <p>20 activated or treated versions.</p> <p>21 A It's my belief.</p> <p>22 MR. GERGELY: I'm going to</p> <p>23 object to this line of questioning as leading.</p> <p>24 Q Let's go to page 35 of Daniels 1.</p> <p>25 A Okay.</p>	<p style="text-align: right;">Page 221</p> <p>1 adsorbent particles to increase the water vapor</p> <p>2 transmission."</p> <p>3 Do you see that?</p> <p>4 A Yes.</p> <p>5 MR. GERGELY: What page are</p> <p>6 you on?</p> <p>7 MR. SONG: Sorry. I'm on</p> <p>8 38, Daniels 1. The first paragraph on the</p> <p>9 page.</p> <p>10 MR. GERGELY: Got it. I'm</p> <p>11 with you.</p> <p>12 Q Paragraph 88, you say in the last sentence, "I</p> <p>13 have been further informed that a reference</p> <p>14 teaches away from a claimed invention when a</p> <p>15 person of ordinary skill in the art, on reading</p> <p>16 the reference, would be led away from the</p> <p>17 claimed invention."</p> <p>18 Do you see that?</p> <p>19 A I do.</p> <p>20 Q And then the following paragraph, 89 at the</p> <p>21 bottom of the page, "Dutta actively discouraged</p> <p>22 the use of non-absorbent particles for the</p> <p>23 purpose of increasing WVTR."</p> <p>24 A Yes.</p> <p>25 Q Moving on to paragraph 90, "Dutta teaches that</p>

<p style="text-align: right;">Page 222</p> <p>1 non-absorbent particles are 'inert' and play no</p> <p>2 role in water vapor transport."</p> <p>3 Do you see that?</p> <p>4 A I do.</p> <p>5 Q That statement in Dutta that we just read in</p> <p>6 paragraph 90, does that comport with your</p> <p>7 conclusions and your analysis with respect to</p> <p>8 Dutta actively teaching away from using active</p> <p>9 particles?</p> <p>10 A It does.</p> <p>11 Q I'm sorry, I can't recall. The Halley</p> <p>12 reference -- my apologies. I can't recall the</p> <p>13 exhibit.</p> <p>14 It was 13. Daniels 13.</p> <p>15 A I'm sorry. You're looking at Halley.</p> <p>16 Got it.</p> <p>17 Q So if you turn to page 3.</p> <p>18 A Okay.</p> <p>19 Q That last sentence in the first paragraph, he</p> <p>20 lists several compounds. Some of those I think</p> <p>21 you might remember from paragraph 30 of the</p> <p>22 Haggquist application.</p> <p>23 So in Haggquist, if I'm recalling</p> <p>24 correctly, your testimony was that those are</p> <p>25 the activated versions of those compounds.</p>	<p style="text-align: right;">Page 224</p> <p>1 chemicals to make them active, correct?</p> <p>2 A Specifically he did not.</p> <p>3 Q In fact, on the facing page the only material</p> <p>4 he said that was treated, he gave the example</p> <p>5 of activated carbon as being treated with heat,</p> <p>6 correct?</p> <p>7 A Correct.</p> <p>8 Q He didn't cite any other material on his list</p> <p>9 as being treated with heat and/or chemicals?</p> <p>10 A He did not specifically call heat and/or</p> <p>11 chemicals.</p> <p>12 Q Do you recall that Dutta actually cautions the</p> <p>13 reader to not use too much of the hydrophilic</p> <p>14 particles because they may cause problems with</p> <p>15 the handling of the material, which could cause</p> <p>16 it to degrade and make holes, correct?</p> <p>17 A Sure.</p> <p>18 Q So is it fair to say that Dutta is actually</p> <p>19 telling the reader that he wishes to avoid</p> <p>20 making holes in the membrane?</p> <p>21 MR. SONG: Objection,</p> <p>22 speculation.</p> <p>23 A I did not interpret it that way. I think my</p> <p>24 interpretation was he cautioned you against</p> <p>25 using too much, not using any, which I think</p>
<p style="text-align: right;">Page 223</p> <p>1 In Halley are these the nonactivated</p> <p>2 versions of those compounds?</p> <p>3 A I have no reason to believe they're the</p> <p>4 activated version.</p> <p>5 Q So these would not be the activated versions?</p> <p>6 A I would not believe so.</p> <p>7 Q Okay. That's all I've got.</p> <p>8 REEXAMINATION OF CHARLES A. DANIELS</p> <p>9 BY MR. GERGELY:</p> <p>10 Q Sir, back to this activation issue that's</p> <p>11 discussed in the Haggquist patent publication.</p> <p>12 Dr. Haggquist specifically states that</p> <p>13 certain materials are active in their natural</p> <p>14 state, correct?</p> <p>15 A He did say that.</p> <p>16 Q He actually called out specifically volcanic</p> <p>17 rock, correct?</p> <p>18 A Right.</p> <p>19 Q That's zeolite?</p> <p>20 A Correct.</p> <p>21 Q Then over on the next page he called out a list</p> <p>22 of items that he deemed to be active particles?</p> <p>23 A Right.</p> <p>24 Q He did not say one way or the other whether</p> <p>25 those had been treated with heat and/or</p>	<p style="text-align: right;">Page 225</p> <p>1 was the essence of your question.</p> <p>2 Q Right. The consequence of using too much is</p> <p>3 that perhaps the material could become damaged?</p> <p>4 A Yes.</p> <p>5 Q It would create cracks or holes in it, correct?</p> <p>6 A Yes.</p> <p>7 Q He wished to avoid that, correct?</p> <p>8 A On the macroscopic sense you sure -- if you're</p> <p>9 going to have a usable product, you want to</p> <p>10 avoid having cracks in it of course.</p> <p>11 Q Because if there are holes in the membrane,</p> <p>12 then that MVTR would spike way up, correct,</p> <p>13 because there would be nothing stopping the</p> <p>14 vapor from getting through?</p> <p>15 A Right.</p> <p>16 Q Okay. I don't have anything further.</p> <p>17 MR. SONG: Okay. The last</p> <p>18 thing on the record, we reserve our right under</p> <p>19 Rule 30 to review and make corrections to</p> <p>20 Dr. Daniels' transcript 30 days from receipt of</p> <p>21 the final transcript.</p> <p>22 MR. GERGELY: Okay. Great.</p> <p>23 - - - - -</p> <p>24 (Deposition was concluded at 4:25 p.m.)</p> <p>25 - - - - -</p>

<p>1 (Signature reserved.) Page 226</p> <p>2 - - - - -</p> <p>3</p> <p>4</p> <p>5</p> <p>6</p> <p>7</p> <p>8</p> <p>9</p> <p>10</p> <p>11</p> <p>12</p> <p>13</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>	<p>1 THE STATE OF ) Page 228</p> <p>2 ) SS:</p> <p>3 COUNTY OF )</p> <p>4</p> <p>5</p> <p>6 Before me, a Notary Public in and for said</p> <p>7 state and county, personally appeared the</p> <p>8 above-named DR. CHARLES A. DANIELS, who acknowledged</p> <p>9 that he did sign the foregoing transcript and that</p> <p>10 the same is a true and correct transcript of the</p> <p>11 testimony so given.</p> <p>12 IN TESTIMONY WHEREOF, I have hereunto affixed</p> <p>13 my name and official seal at</p> <p>14 this day of</p> <p>15 , 20 .</p> <p>16</p> <p>17</p> <p>18</p> <p>19 DR. CHARLES A. DANIELS</p> <p>20</p> <p>21 Notary Public</p> <p>22 My Commission expires:</p> <p>23</p> <p>24</p> <p>25</p>
<p>1 THE STATE OF OHIO, ) SS: Page 227</p> <p>2 COUNTY OF CUYAHOGA. )</p> <p>3</p> <p>4 I, Sarah R. Drown, a Registered Professional</p> <p>5 Reporter and Notary Public within and for the State</p> <p>6 of Ohio, duly commissioned and qualified, do hereby</p> <p>7 certify that DR. CHARLES A. DANIELS, was first duly</p> <p>8 sworn to testify the truth, the whole truth and</p> <p>9 nothing but the truth in the cause aforesaid; that</p> <p>10 the testimony then given by him was by me reduced to</p> <p>11 stenotypy in the presence of said witness,</p> <p>12 afterwards transcribed on a computer/printer, and</p> <p>13 that the foregoing is a true and correct transcript</p> <p>14 of the testimony so given by him as aforesaid.</p> <p>15 I do further certify that this deposition was</p> <p>16 taken at the time and place in the foregoing caption</p> <p>17 specified. I do further certify that I am not a</p> <p>18 relative, counsel or attorney of either party, or</p> <p>19 otherwise interested in the event of this action.</p> <p>20 IN WITNESS WHEREOF, I have hereunto set my hand</p> <p>21 and affixed my seal of office at Cleveland, Ohio, on</p> <p>22 this 10th day of December, 2018.</p> <p>23 </p> <p>24 Sarah R. Drown, RPR, Notary Public</p> <p>25 within and for the State of Ohio</p> <p>My Commission expires April 22, 2022.</p>	<p>1 DEPOSITION ERRATA SHEET Page 229</p> <p>2 Page No. Line No. Change to:</p> <p>3 Reason for change:</p> <p>4 Page No. Line No. Change to:</p> <p>5 Reason for change:</p> <p>6 Page No. Line No. Change to:</p> <p>7 Reason for change:</p> <p>8 Page No. Line No. Change to:</p> <p>9 Reason for change:</p> <p>10 Page No. Line No. Change to:</p> <p>11 Reason for change:</p> <p>12 Page No. Line No. Change to:</p> <p>13 Reason for change:</p> <p>14 Page No. Line No. Change to:</p> <p>15 Reason for change:</p> <p>16 Page No. Line No. Change to:</p> <p>17 Reason for change:</p> <p>18 Page No. Line No. Change to:</p> <p>19 Reason for change:</p> <p>20 Page No. Line No. Change to:</p> <p>21 Reason for change:</p> <p>22 Page No. Line No. Change to:</p> <p>23 Reason for change:</p> <p>24 SIGNATURE: DATE:</p> <p>25</p>

<p style="text-align: center;"><b>1</b></p> <hr/> <p><b>1</b> 6:15,17,20 95:1 97:1,3,4 107:22 112:6,7,11 149:4 152:1 156:14,16,20 157:4,5,18,21 158:9 160:3 167:4 171:3,13 173:7 179:13 180:12 182:10,12,22 183:5,24 184:15,18,19,20,23,24, 25 185:4,6 187:6 188:3, 9,16,23 206:10,12 207:15 208:19 209:14 218:5 219:24 221:8</p> <p><b>1,000</b> 138:1 139:21 144:1,3</p> <p><b>1,475</b> 143:10 144:5</p> <p><b>1.5</b> 158:22</p> <p><b>1.55</b> 93:21</p> <p><b>10</b> 24:8 48:23 95:25 96:4 109:4 112:2,23 113:3,18, 22 114:10,12 116:1,8,20 117:16,19 118:10,12,19, 21 119:7,9,22,24 120:9, 15,18,20,21 121:1,4 162:24,25 163:1,13 164:4 165:22 172:6,7 178:15 185:21 206:7,22</p> <p><b>100</b> 176:9</p> <p><b>1028</b> 142:16</p> <p><b>104</b> 177:20</p> <p><b>10X</b> 112:1</p> <p><b>11</b> 80:1 85:11,12,14 109:6, 9,10 122:25</p> <p><b>111</b> 193:25</p> <p><b>112</b> 207:9</p>	<p><b>115</b> 196:2,11</p> <p><b>12</b> 95:17 109:22,25 123:23 125:1 164:18,19</p> <p><b>12-2</b> 71:15,16</p> <p><b>12.14</b> 74:18</p> <p><b>13</b> 14:14 110:1 126:3,5,8 151:16 152:2,10 155:11, 17,19,22 156:13 163:14 211:22,24 222:14</p> <p><b>14</b> 138:10,13 182:25 183:9 184:14 209:23</p> <p><b>14,000</b> 157:10</p> <p><b>1400</b> 165:7</p> <p><b>15</b> 85:9 98:2 141:19,21 142:4,14,16 143:6,11 148:15 151:16 176:16 191:6 218:4,7,8</p> <p><b>1501.8</b> 146:9</p> <p><b>16</b> 98:18 141:23,25 142:4, 18,25 145:18,22 177:3</p> <p><b>16,000</b> 157:10</p> <p><b>17</b> 92:12,13 98:18 111:6 209:20,24 210:10</p> <p><b>17,000</b> 157:10</p> <p><b>18</b> 183:10 184:14</p> <p><b>19</b> 98:4</p> <p><b>192</b> 81:23,25</p> <p><b>1A</b> 92:11,13,14</p>	<p><b>1B</b> 92:15,18,21 94:12,19</p> <hr/> <p style="text-align: center;"><b>2</b></p> <hr/> <p><b>2</b> 6:15 31:1,3,6,10 82:25 96:11 97:3,4 98:4 144:17,18 146:22 160:3, 10 163:1,2,15,21 171:12, 13 174:25</p> <p><b>2.1</b> 143:7,8</p> <p><b>2.5</b> 114:9,12 119:13,24 120:21</p> <p><b>2.67</b> 146:23 150:12</p> <p><b>20</b> 95:16,18 119:11 152:4 164:3,12 165:10,14 198:4,6,9 210:15,16</p> <p><b>2000</b> 136:1,5,7,9,17 143:9 144:4 145:7,13 146:10, 14,17,22 147:12 148:4,7, 16 149:23 150:5,11,22 151:15 153:2,5 155:14, 15,24 156:18 169:20 174:12,15 175:11 176:3, 20 177:6,17 211:22,25 212:3</p> <p><b>2005</b> 10:8</p> <p><b>201</b> 83:1</p> <p><b>2011</b> 193:4</p> <p><b>2012</b> 193:4</p> <p><b>203</b> 83:20</p> <p><b>204</b> 87:18</p> <p><b>206</b> 89:2</p> <p><b>23</b> 123:23</p>	<p><b>24</b> 92:23 93:7 175:1</p> <p><b>25.4</b> 112:7,11 118:20 119:24</p> <p><b>26</b> 85:9,14</p> <p><b>27</b> 194:4</p> <p><b>273</b> 85:7</p> <p><b>28</b> 54:9 110:6 111:16</p> <p><b>284</b> 85:6</p> <p><b>287</b> 14:20 95:20 96:2,8 103:4 104:10 106:5 108:5,17 114:8 139:8 163:12,16, 22 168:18,22 170:19 171:3,24 172:1,16 177:24,25 178:8 194:4, 13 206:6 217:14 219:18</p> <hr/> <p style="text-align: center;"><b>3</b></p> <hr/> <p><b>3</b> 6:15 49:23,25 50:3 65:4 97:3,4 131:24,25 140:16 157:21 158:8,17 160:4 161:4 163:14,19,20 165:5 171:13 177:16 216:7 222:17</p> <p><b>3,000</b> 15:24 143:21</p> <p><b>3.1</b> 145:25</p> <p><b>30</b> 55:20 123:23 216:7,11 217:13,19 218:22 219:2 222:21 225:19,20</p> <p><b>31</b> 65:8</p> <p><b>32</b> 65:5,7</p> <p><b>320</b> 164:23</p> <p><b>33</b></p>
---	--	---	---

183:1	164:9 165:1 172:6,7 211:7,12 212:22	<hr/> <b>7</b> <hr/>	<b>902</b> 26:4 68:15 69:8 77:14,23 80:14 81:4 142:22
<b>34</b> 90:15	<b>50</b> 112:13	<b>7</b> 12:7 77:3,7,18 78:2,9,12, 16 87:19 138:14 140:18 151:24,25	<b>93</b> 210:15,16
<b>35</b> 175:1 219:24	<b>51</b> 198:1	<b>7155</b> 172:3	<b>95</b> 121:24
<b>36</b> 93:19	<b>52</b> 197:5	<b>717</b> 74:18	<b>96</b> 98:21
<b>36.8</b> 93:22	<b>55</b> 95:17 200:5	<b>7700</b> 161:10	<b>98</b> 126:12 148:24 149:5 152:12
<b>38</b> 220:18 221:8	<b>5564</b> 112:15,20,21 113:2,7 116:25 117:4	<hr/> <b>8</b> <hr/>	<b>99</b> 173:9 176:9
<b>39</b> 14:14 15:9 50:16	<b>56</b> 85:9,15	<b>8</b> 80:7,10,19 88:22 142:3 156:14 179:12,13	<hr/> <b>A</b> <hr/>
<b>3D</b> 21:23,25 22:1	<b>57</b> 65:8	<b>80</b> 90:13 99:3 100:22 164:22	<b>AA</b> 210:11
<hr/> <b>4</b> <hr/>	<b>59</b> 78:14,18	<b>800</b> 164:14	<b>ability</b> 74:25 76:18 102:17,20 195:14 209:6 212:6
<b>4</b> 25:6 29:22 30:16 31:9 52:19,21 53:1,6,15,16,17 164:9 215:25 219:2,3	<hr/> <b>6</b> <hr/>	<b>81</b> 103:16	<b>abrasion</b> — 173:14 174:2,7 176:13 177:13 —
<b>40</b> 31:18 35:6 164:11,22	<b>6</b> 52:25 77:2,5,10,17 78:2, 9,11 84:1,22 110:7 139:13	<b>85</b> 107:21	<b>absolute</b> 170:10
<b>41</b> 121:25	<b>62</b> 146:8	<b>87</b> 220:18	<b>absorb</b> 18:3 32:16 35:24 49:8,15 93:7 155:21
<b>42</b> 40:17	<b>6356</b> 163:25	<b>88</b> 221:12	<b>absorbed</b> 10:24 17:17 18:2 20:21, 25 32:7 35:2,9 41:2 42:5, 6 66:18
<b>43</b> 51:10 59:12 218:4,9	<b>65</b> 158:20	<b>89</b> 221:20	<b>absorbent</b> 18:22 19:15,19 49:13 60:21 61:6 104:9 123:2 124:3
<b>44</b> 62:7	<b>6631</b> 164:6	<hr/> <b>9</b> <hr/>	<b>absorbing</b> 16:18 17:5 18:9 23:10 47:13 49:18 59:14,21 60:6,7,8 61:9,17,24 62:22 90:6 155:25
<b>47</b> 63:24	<b>6673</b> 172:3	<b>9</b> 91:21,24 122:23 142:3 178:11 179:10 181:7 183:9	<b>absorbs</b> 17:11 39:15 136:17
<b>49</b> 112:5	<b>6730</b> 95:5,11	<b>90</b> 221:25 222:6	<b>absorption</b> 14:18,23 20:6,11,12 23:9
<b>4911</b> 146:2	<b>697</b> 69:25 70:1	<b>901</b> 26:4 68:15 69:8 77:14,22 80:14 81:4 142:22	
<b>4:25</b> 225:24	<b>698</b> 69:20,25 70:21		
<hr/> <b>5</b> <hr/>			
<b>5</b> 68:6,8,18 84:3 96:3			

31:21 37:19 39:1,4 40:18,19,25 41:10,16 42:2 43:9 51:12 86:8,9, 14,15,16 92:22 95:3 102:22 155:23 173:12 200:12	<b>act</b> 51:16 218:17	57:11 103:17,25 220:25 221:21 222:8	49:8,15 53:11,19 54:13 76:12,18 139:18,23 140:23 144:23 145:3,7
<b>absorptions</b> 200:6	<b>action</b> 36:7 39:2 79:21 89:5	<b>activity</b> 31:23 55:19 56:6 57:20 131:14 133:5	<b>adsorbate</b> 23:8,12 29:5 46:12
<b>absorptive</b> 32:6,11,14,18,23 43:13 63:25 64:7 90:18	<b>activated</b> 15:16,19 23:21 24:4,7,15 25:19 26:21 27:1,6,14,21 29:4,6 31:11 37:3,11,18 38:2,7,9 39:6 49:11,19, 20 51:13,14,22 52:2,4 56:10,20 62:15 67:11 102:11 104:20,23 107:4 112:14,16,20,22 114:16 115:4,23 131:18,19 137:9,21 143:14,20,22 147:4,10,13 149:7 150:14 151:5 152:8 154:4,16 169:21 175:21 179:15,18 180:11,15,18 181:4,20 183:12,21 184:2,3,8 201:14,17,23 203:6 211:17,20 212:1,6, 24 213:24 214:2 217:4, 17,21 218:14,15 219:4,9, 13,20 222:25 223:4,5 224:5	<b>actual</b> 91:6 172:7 205:16	<b>adsorbed</b> 18:14 23:16 34:22 35:1 45:17 46:2 62:19 66:18 70:4 71:12 73:13 82:5 83:3,8,11,16 88:24 89:5 161:22
<b>abstract</b> 78:11 81:16	<b>activating</b> 55:6	<b>ad</b> 41:17,18 217:1	<b>adsorbent</b> 17:23 19:8 23:3,16,17 39:6 49:12,21 60:22 61:6 71:14 175:24 176:6 221:1
<b>abundance</b> 211:3	<b>activation</b> 217:5 219:16 223:10	<b>add</b> 41:24 174:8 176:12	<b>adsorbing</b> 16:11 18:13 51:16,19,21 52:2 60:12 61:21,24 90:6 102:16 136:11 148:17 176:20 218:17
<b>accept</b> 82:21 157:12 160:21 177:4 180:25	<b>active</b> 17:6,25 31:23 32:2 37:5, 15 38:1 52:7,10,15 53:10,18,23 54:2,8,11,22 55:12,14,22,24 56:3,8 57:8,12,13,18 58:4 59:1 62:10 72:10 102:12 103:11 106:6,19 107:1,5 110:17,19 111:18 122:14 125:10 126:13,17 129:6 131:2,3,6,11,21 132:12, 21 133:2,3,4,8,10,19,23 134:5,10,11,21 135:5,10, 17,19,23,25 137:25 139:16,22 140:19,21 141:5,6,8,9 143:25 144:10 147:17 149:25 150:14 181:25 196:4 216:21,22,24 217:1,12, 14,17 219:9,16 222:8 223:13,22 224:1	<b>addendum</b> 119:7	<b>adsorbs</b> 16:4 73:3 136:18 177:6
<b>acceptable</b> 106:11 133:16 155:4 156:7	<b>activating</b> 55:6	<b>adding</b> 158:16 159:18 161:20 175:21 176:3,5,10,14 177:9	<b>adsorption</b> 10:17 14:18 15:15 22:25 23:6 31:21,22 39:4 40:18 41:4,8,20 43:9 51:12,24 60:17 71:18 72:7 73:16 81:17 82:4 86:4 87:19,24 88:1,8,10 102:23
<b>accepted</b> 98:16 99:1	<b>activation</b> 217:5 219:16 223:10	<b>addition</b> 65:17 76:11 173:13,22 174:1 175:11	<b>adsorption-desorption</b> 44:8,10,24 45:5 47:14 74:10 81:20 83:24 84:23 85:18,20,24 87:10
<b>accomplished</b> 130:21 217:6	<b>active</b> 17:6,25 31:23 32:2 37:5, 15 38:1 52:7,10,15 53:10,18,23 54:2,8,11,22 55:12,14,22,24 56:3,8 57:8,12,13,18 58:4 59:1 62:10 72:10 102:12 103:11 106:6,19 107:1,5 110:17,19 111:18 122:14 125:10 126:13,17 129:6 131:2,3,6,11,21 132:12, 21 133:2,3,4,8,10,19,23 134:5,10,11,21 135:5,10, 17,19,23,25 137:25 139:16,22 140:19,21 141:5,6,8,9 143:25 144:10 147:17 149:25 150:14 181:25 196:4 216:21,22,24 217:1,12, 14,17 219:9,16 222:8 223:13,22 224:1	<b>additional</b> 12:13,24 40:16 66:21 159:25 167:6 181:23	<b>adsorptive</b> 32:3 43:24 44:11,24 45:15 46:10 48:13,15 62:8,16 64:19,21
<b>account</b> 24:2 170:6	<b>activating</b> 55:6	<b>additive</b> 18:8 174:13,16	<b>aerospace</b> 9:12
<b>accuracy</b> 141:1,14 160:14	<b>activation</b> 217:5 219:16 223:10	<b>additives</b> 174:10	<b>age</b> 5:2
<b>accurate</b> 28:12 78:24 117:15 139:25	<b>active</b> 17:6,25 31:23 32:2 37:5, 15 38:1 52:7,10,15 53:10,18,23 54:2,8,11,22 55:12,14,22,24 56:3,8 57:8,12,13,18 58:4 59:1 62:10 72:10 102:12 103:11 106:6,19 107:1,5 110:17,19 111:18 122:14 125:10 126:13,17 129:6 131:2,3,6,11,21 132:12, 21 133:2,3,4,8,10,19,23 134:5,10,11,21 135:5,10, 17,19,23,25 137:25 139:16,22 140:19,21 141:5,6,8,9 143:25 144:10 147:17 149:25 150:14 181:25 196:4 216:21,22,24 217:1,12, 14,17 219:9,16 222:8 223:13,22 224:1	<b>address</b> 194:20	<b>agent</b> 55:6 57:7 59:25 65:18
<b>accurately</b> 214:15	<b>activation</b> 217:5 219:16 223:10	<b>adds</b> 110:15,23 164:3,11 165:5,12,17	<b>agglomerate</b> 199:6
<b>accused</b> 205:8	<b>active</b> 17:6,25 31:23 32:2 37:5, 15 38:1 52:7,10,15 53:10,18,23 54:2,8,11,22 55:12,14,22,24 56:3,8 57:8,12,13,18 58:4 59:1 62:10 72:10 102:12 103:11 106:6,19 107:1,5 110:17,19 111:18 122:14 125:10 126:13,17 129:6 131:2,3,6,11,21 132:12, 21 133:2,3,4,8,10,19,23 134:5,10,11,21 135:5,10, 17,19,23,25 137:25 139:16,22 140:19,21 141:5,6,8,9 143:25 144:10 147:17 149:25 150:14 181:25 196:4 216:21,22,24 217:1,12, 14,17 219:9,16 222:8 223:13,22 224:1	<b>adhere</b> 23:3	<b>agglomerates</b> 196:14
<b>Acetylene</b> 146:9,15,18	<b>activation</b> 217:5 219:16 223:10	<b>adhered</b> 195:12 199:11	
<b>achieved</b> 213:12	<b>active</b> 17:6,25 31:23 32:2 37:5, 15 38:1 52:7,10,15 53:10,18,23 54:2,8,11,22 55:12,14,22,24 56:3,8 57:8,12,13,18 58:4 59:1 62:10 72:10 102:12 103:11 106:6,19 107:1,5 110:17,19 111:18 122:14 125:10 126:13,17 129:6 131:2,3,6,11,21 132:12, 21 133:2,3,4,8,10,19,23 134:5,10,11,21 135:5,10, 17,19,23,25 137:25 139:16,22 140:19,21 141:5,6,8,9 143:25 144:10 147:17 149:25 150:14 181:25 196:4 216:21,22,24 217:1,12, 14,17 219:9,16 222:8 223:13,22 224:1	<b>adhering</b> 22:19	
<b>acid</b> 58:10,13 59:15 203:5,7	<b>activation</b> 217:5 219:16 223:10	<b>admittedly</b> 131:3	
<b>acknowledge</b> 79:5 149:8 177:14	<b>active</b> 17:6,25 31:23 32:2 37:5, 15 38:1 52:7,10,15 53:10,18,23 54:2,8,11,22 55:12,14,22,24 56:3,8 57:8,12,13,18 58:4 59:1 62:10 72:10 102:12 103:11 106:6,19 107:1,5 110:17,19 111:18 122:14 125:10 126:13,17 129:6 131:2,3,6,11,21 132:12, 21 133:2,3,4,8,10,19,23 134:5,10,11,21 135:5,10, 17,19,23,25 137:25 139:16,22 140:19,21 141:5,6,8,9 143:25 144:10 147:17 149:25 150:14 181:25 196:4 216:21,22,24 217:1,12, 14,17 219:9,16 222:8 223:13,22 224:1	<b>adsorb</b> 14:22 15:17,20 35:24	
<b>acronym</b> 58:9	<b>actively</b>		

<b>agglomeration</b> 198:25 199:2	<b>amendment</b> 111:4	169:20 197:8	<b>argue</b> 162:6,7
<b>aggregate</b> 114:20	<b>amendments</b> 112:4	<b>apples</b> 159:15 167:7,16 170:15	<b>argumentative</b> 107:11,15 116:24 154:7 189:3,6 207:23
<b>agree</b> 29:3 54:3,7,18,25 55:10 56:2 78:24 79:18 87:9 90:4,10 99:7 105:24 106:2 118:4,12 120:19 124:25 131:1 133:3 135:9 136:4,9 139:25 141:1,14 143:13 148:6, 15 167:25 168:17 169:19 189:17,25 190:11,18,22	<b>amount</b> 10:24 33:2,3 34:3 42:5 45:17 46:5 48:19 57:10 83:16 102:24 157:20,25 161:21 162:2 167:1,10 191:5	<b>applicable</b> 187:9	<b>arguments</b> 109:11 111:12
<b>agreed</b> 31:12	<b>amounts</b> 83:2,7,11 159:18 162:20 169:7,8 171:16	<b>applicant</b> 111:15	<b>arrangement</b> 124:2,7
<b>ahead</b> 45:9 174:5	<b>analyses</b> 9:6 11:4	<b>application</b> 75:13 133:15 160:17 193:4 216:1 222:22	<b>arrive</b> 220:23
<b>air</b> 67:22 123:1 125:13 190:14 202:12	<b>analysis</b> 27:1 126:19 133:11 191:16 193:25 194:2,3 212:12 213:1 214:24 222:7	<b>applied</b> 91:1 99:16 108:10 116:14 179:20 218:21	<b>arrived</b> 8:4
<b>Albert's</b> 13:22	<b>analysts</b> 202:19	<b>applies</b> 170:9 182:12	<b>arrow</b> 73:15,16,23 74:3
<b>allegedly</b> 14:23 157:22 161:20	<b>Analytical</b> 210:12	<b>applying</b> 100:23	<b>arrows</b> 72:21 74:5
<b>alleges</b> 177:5	<b>and/or</b> 53:13,21 54:14 89:8 139:19 223:25 224:9,10	<b>appreciated</b> 131:9	<b>art</b> 27:5 72:1 83:13 89:23 115:2 118:5,23 133:8 141:7 147:3 176:18 219:12 220:19,21 221:15
<b>allowed</b> 130:25	<b>answer's</b> 74:14,15 89:21,22 207:2	<b>approach</b> 36:15 43:13 47:19,20 48:5,17 68:20 143:21 191:4	<b>article</b> 80:19 143:6 145:19
<b>alter</b> 51:15 218:16	<b>answering</b> 75:11	<b>approaches</b> 86:22	<b>articles</b> 27:6,10,15,18,20 62:3 90:5,9 142:5 148:6 216:15
<b>alternate</b> 123:17	<b>answers</b> 77:24 80:16 142:24 210:12	<b>approaching</b> 45:12,13	<b>artifact</b> 200:25
<b>alternative</b> 123:25	<b>anticipate</b> 162:1	<b>approximately</b> 140:16 182:10	<b>Asbury</b> 112:15,20,21 113:2,7 116:25 117:4
<b>alumina</b> 56:10 70:24 71:1	<b>anticipated</b> 107:22	<b>approximation</b> 33:1	<b>ash</b> 57:15,23 58:4
<b>aluminum</b> 51:14 56:10 132:7 135:21 201:5 218:15	<b>apologies</b> 222:12	<b>approximations</b> 137:10	<b>asserted</b> 194:11
<b>ambiguous</b> 27:9,17 126:24 143:17 144:12 147:6 166:19 169:23 192:11 193:11	<b>apparent</b> 193:20	<b>area</b> 9:6 10:13 11:1 15:24 16:9,10 18:17 28:8 34:20 47:11 48:20 52:12 56:9 57:10 86:11 95:5 131:20 132:21 134:12 136:5 137:14,15,23 138:1 139:22 143:10,14 144:1, 5,22 146:8 149:15,16,24 161:21 199:25 200:12 202:21 216:25	<b>asserting</b> 79:21
<b>amended</b> 110:9 111:15 114:4	<b>appearing</b> 66:12	<b>areas</b> 20:23,24 43:25 150:19 196:22	<b>assume</b> 117:14 118:5 135:5 185:19
	<b>appears</b> 72:9 76:24 117:11 158:3		<b>assumed</b> 28:17
			<b>assumes</b> 22:8 193:10 195:5

<b>assuming</b> 193:6 208:25 209:2	<b>attorney-client</b> 6:11 7:9	<b>aware</b> 83:10 145:6 147:16 150:13 176:19	<b>bead</b> 22:11,12,17 39:20 79:10
<b>assumption</b> 135:7,18 183:10,15 184:12 186:12 192:15	<b>attract</b> 102:17,21	<b>awhile</b> 45:4	<b>beads</b> 78:20 79:4,9,21
<b>assurance</b> 167:4	<b>attracted</b> 37:9	<b>axis</b> 87:2	<b>beam</b> 213:19
<b>assure</b> 193:14	<b>attractive</b> 37:7		<b>began</b> 9:2
<b>ASTM</b> 98:4,11,20,21	<b>attributable</b> 201:7 202:1,7,24	<b>B</b>	<b>begin</b> 63:4
<b>asymptote</b> 47:25	<b>attributes</b> 95:2	<b>back</b> 9:2 10:6 19:9,17,20,23 23:14,19 59:11 63:7 65:4 66:4 67:4 69:15 73:11,12 86:2 91:10 99:3 121:24 135:22 151:3 161:19 162:16 165:1 173:6 183:9 191:5 198:1 206:2, 4,6 209:22 210:13,18 223:10	<b>beginning</b> 36:24
<b>asymptotic</b> 48:8 86:18,21,24	<b>authenticate</b> 78:5		<b>begins</b> 21:19
<b>asymptotically</b> 86:14	<b>authenticated</b> 25:12 26:4 68:15 69:8 77:14,22 80:14 81:4 100:19 142:22	<b>background</b> 145:12	<b>behavior</b> 8:24 65:2 212:3
<b>atomic</b> 213:10	<b>authentication</b> 139:2	<b>backwards</b> 47:16	<b>belief</b> 114:21 126:25 219:21
<b>atoms</b> 23:1	<b>author</b> 65:15 66:23 70:2 75:21 78:19 107:6 143:8 144:20 145:2 146:7,11 211:2 212:15	<b>bacteriostatic</b> 65:18	<b>believed</b> 193:2 206:9
<b>attach</b> 30:20 31:13	<b>author's</b> 72:1	<b>balance</b> 18:20	<b>believes</b> 188:10
<b>attached</b> 112:19 117:8	<b>authors</b> 68:25 74:21 76:8 79:8 81:14,16 82:10 83:2,22 84:22 87:18 90:5 96:13, 23	<b>bar</b> 182:11	<b>beneath</b> 24:22
<b>attaching</b> 30:10,11,13 38:5,14 105:12	<b>automate</b> 9:16	<b>bars</b> 171:25	<b>BET</b> 10:19
<b>attempt</b> 10:23 61:12 63:6 130:22	<b>automatic</b> 66:20 209:3	<b>base</b> 110:10,18 111:17 175:16 176:4 179:24 182:10 184:1 207:1	<b>BFGOODRICH</b> 9:9,11
<b>attempted</b> 196:15	<b>average</b> 116:9 155:16,22 214:11, 18	<b>based</b> 9:24 10:18 14:21 70:18 71:24 127:2 130:9,16 142:24 148:6 186:16 188:11,14,19 193:25 206:24 207:2 210:23 211:3 212:8 217:2	<b>biased</b> 129:17
<b>attempting</b> 84:16 167:9 170:10 178:12 183:4	<b>averages</b> 160:21 214:19	<b>basically</b> 5:14 10:23 16:3 81:22	<b>big</b> 154:5 160:20
<b>attempts</b> 195:17	<b>averaging</b> 214:7	<b>basis</b> 27:2 88:7 115:22 165:6 166:14,16 169:18	<b>bigger</b> 42:14 116:10 118:19
<b>attention</b> 14:13 50:15 53:6 65:4 69:20 74:17 78:13 81:23 82:25 96:11 110:6 139:13 145:24 156:11,14 163:21 165:4 174:25 206:5 210:10,11	<b>avoid</b> 107:7,12 224:19 225:7, 10		<b>bills</b> 5:24 6:1
<b>attorney</b> 130:7			<b>binding</b> 71:1
			<b>biochemical</b> 82:12
			<b>bit</b> 20:15,18 95:15 156:4 220:17
			<b>black</b>

106:20 131:11 136:1,4,7, 9,17 143:9 144:4 145:2, 7,13 146:9,10,14,16,17, 18,22 147:12 148:4,7,16 149:23 150:5,11,22 151:15 152:13 153:2,5 154:21 155:14,15,23 156:9,18 157:20,25 158:12 167:2,10,24 169:8,20 174:12,15 175:11 176:3,20 177:5, 17 196:22 197:2,16 211:22,25 212:3	84:4 203:21 <b>boundaries</b> 198:22 <b>boundary</b> 199:7,9,13 <b>Bowman</b> 14:11 <b>box</b> 71:10,11 72:15 <b>boy</b> 57:12 <b>BP</b> 143:9 144:21 145:2 <b>breadth</b> 11:21 <b>break</b> 48:23 80:2 121:16 163:4, 7 191:9 <b>breaking</b> 63:14 <b>breathable</b> 110:10,18 <b>briefly</b> 6:7 127:21 191:9 210:20 <b>broken</b> 9:11 <b>Brownian</b> 46:24 <b>Brunauer</b> 10:22 <b>buffer</b> 91:14 92:6,19 <b>bumps</b> 46:8 <b>bunch</b> 200:18 <b>bury</b> 123:6 <b>business</b> 5:14	<b>calculate</b> 10:25 11:2,12 <b>Calen</b> 14:2 <b>calibrated</b> 209:3 <b>calipers</b> 207:21 208:13,15,17 <b>call</b> 6:15 8:11 12:5 20:13 36:19 44:4 46:8 60:5 62:4 80:17 96:14 98:20 128:22 153:5 155:20 187:17 189:13,16,25 200:2,11 205:20,22 216:11 224:10 <b>call-out</b> 70:22,25 <b>called</b> 5:2 9:9 11:6 38:2 59:2 95:11 108:4 125:7 132:17 146:4 176:12 191:19 204:16 223:16,21 <b>calling</b> 7:7 135:6 <b>calls</b> 7:3 13:4 24:12 70:18 71:4,24 72:25 73:19 74:12 75:10 76:3,23 79:1,17 81:6 82:19 83:6, 15 84:13 85:22 87:13 88:3,20 89:10,16 100:20 105:10,16 115:17 116:4 117:21 118:15 119:2,18 120:3,5,24 122:18 123:20 124:9,23 125:5, 15 127:12 128:6,18 129:11 130:14 132:16 133:1,16 135:14 136:13 138:4 139:3 142:23 143:18 144:13 145:10 147:6,20 148:10,19 150:2,17 151:13,19 152:18 154:19 156:24 161:17 162:14 166:12,20 168:8,20 169:24 172:19 173:20 176:23 184:10 185:14 207:8,24 <b>capability</b> 144:23 145:3 148:17 194:23	<b>capable</b> 52:11 64:1 99:13 102:15 135:8 147:10 213:9 <b>capacity</b> 16:2 32:4,7,10 33:8 34:8, 9,10,16,18,19 36:5 44:6 47:15,17 53:11,19 54:13 60:24 72:14 92:22 93:8, 12 94:13 139:17,23 140:22 <b>captures</b> 12:19 <b>carbohydrate</b> 75:23 82:5 <b>carbohydrates</b> 76:6 <b>carbon</b> 20:24 23:21 24:4,8,15 25:19 26:21 27:1,7,14,21 29:4,6 31:11 37:3,11 38:2,9 51:13 55:4 56:20 67:12 96:21,24 97:7 102:11 104:20,23 106:20 112:14,16,21,22 114:16 115:4 131:11,18 132:2 137:9,22 143:15,20,22 146:5 147:4,10,13 149:6, 7,13,18 150:15 151:4,5 152:9,10,11,13,20,22 153:8,25 154:3,4,9,11,21 156:9 157:20,22,25 158:12 159:25 164:3,12, 22 165:6 167:1,6,10,24 168:2,3,7,15 169:8,21 171:15,17 175:22 179:16,18 180:11,15,18 181:4,20 182:5 183:12, 21,22 184:2,4,8 200:11 201:2,3,14,17,23 202:4 203:6 211:3,15,19 212:21 213:11,15 218:14 224:5 <b>carbons</b> 62:15 <b>career</b> 9:2 <b>carefully</b> 66:10 <b>cares</b> 204:10
<b>blacks</b> 154:11 <b>blending</b> 123:25 <b>blood</b> 10:3 <b>board</b> 108:11,14,15 127:5,16, 21 128:8,12 129:4 130:2, 6,23 187:17,18 189:13, 16,18,25 190:7,9 <b>board's</b> 65:8 128:1,15 129:7 208:9 <b>bold</b> 75:21 <b>bond</b> 37:23 70:23 89:20 <b>bond's</b> 89:20 <b>bonding</b> 37:24 38:1,13,19,25 40:11 70:11,19 71:2 89:12,13 <b>bonds</b> 89:7,18 <b>book</b> 100:16 <b>bottom</b> 20:3 70:1 87:2 148:24 184:19 197:5 206:10 210:14 221:21 <b>bounces</b> 72:17 <b>bound</b>	<b>calcium</b> 200:21 202:24 203:2		

<b>carved</b> 33:21	<b>certified</b> 5:4	14,22 37:13 51:15,23 59:8 147:25 194:19 217:10 218:16,19,25	<b>citing</b> 54:8 128:9 136:16
<b>case</b> 5:19 6:22 10:8 13:14 14:1,11 15:20 19:14,20 20:21 21:7 29:4 32:12 33:14 34:13 42:24 43:12, 24 44:2 47:4 50:7 60:23 64:15 78:6 87:17 89:24 95:4 96:9 101:2 120:10, 20 125:12 155:15 167:6, 7 169:12 170:13 172:8, 10 181:1,17,21,25 191:16 199:23 205:15	<b>cetera</b> 175:9	<b>chemically</b> 75:22 104:16,18 105:1,3, 7 217:8	<b>claim</b> 102:25 103:9 110:6,9 112:4 127:3,13 128:12 130:17,18 143:22 161:13 188:11 194:4 205:5 215:2
<b>cases</b> 5:18 9:19 19:19 21:16 56:14 60:24 62:25 197:20	<b>challenge</b> 9:15	<b>chemicals</b> 9:13 82:7 224:1,9,11	<b>claimed</b> 119:24 122:3 149:25 156:22 161:14 220:23 221:14,17
<b>cast</b> 206:11	<b>challenged</b> 215:5	<b>chemist</b> 8:21	<b>claims</b> 103:4,8,10 107:21 111:15 114:3,8,11 129:14 170:4,7 178:16, 22 179:5
<b>casting</b> 208:22	<b>challenging</b> 18:15	<b>chemistry</b> 22:17 37:6 51:16 52:5 55:14 57:21 74:4 100:9, 16 218:17	<b>clarification</b> 182:21
<b>casts</b> 181:23	<b>chance</b> 64:4 143:1 218:11	<b>chlorine</b> 203:24,25	<b>clarify</b> 41:14 101:18
<b>catalyst</b> 10:15	<b>chances</b> 202:16	<b>choice</b> 160:5	<b>classic</b> 44:10,23 85:19 87:10
<b>causing</b> 59:17	<b>change</b> 16:12 18:21 19:1,2 40:15 46:6 63:5 72:14 99:5 157:14 192:21 217:10	<b>choose</b> 36:12 208:18	<b>classically</b> 60:5
<b>cautioned</b> 224:24	<b>changed</b> 192:17	<b>chromatographic</b> 82:13	<b>classified</b> 175:25
<b>cautions</b> 224:12	<b>changing</b> 74:7 193:16	<b>chromatography</b> 56:16,19,21,23 59:2 69:23 74:19,22 78:21	<b>clean</b> 15:23
<b>cell</b> 10:3	<b>channels</b> 99:23 101:3,19,22,23,25 102:9 220:4,6,11,14	<b>cinnamic</b> 58:9,13	<b>clear</b> 30:3 35:9 101:12,21 129:2 168:14 197:8 202:11 208:12 217:22
<b>Celsius</b> 85:6,9,14,15	<b>chapter</b> 69:22 71:8	<b>cinoxate</b> 58:6,8	<b>Cleveland</b> 191:5
<b>center</b> 197:9	<b>character</b> 72:16	<b>circulating</b> 67:22	<b>click</b> 40:13,14
<b>centered</b> 35:13	<b>characteristics</b> 155:23 166:25	<b>circumference</b> 24:2 29:11,12	<b>close</b> 80:1
<b>centimeter</b> 137:4	<b>characterization</b> 9:4 117:15	<b>citations</b> 155:20	<b>closely</b> 196:12 197:21
<b>centimeters</b> 146:23 150:12	<b>characterize</b> 39:3 206:16	<b>cite</b> 12:15 224:8	<b>clump</b> 66:24 114:19
<b>certainty</b> 173:4	<b>characterized</b> 59:21 61:20,22,23 62:2	<b>cited</b> 13:24 14:23 25:9 26:1 63:1 69:5 80:11 81:1 99:12 100:17 135:23 136:21 138:23 142:19 150:7 171:24	<b>Clumps</b> 66:11
	<b>Charles</b> 5:1,6,11 215:23 223:8	<b>cites</b> 125:8 135:17 178:21 184:23	<b>cluster</b>
	<b>chart</b> 205:5,12 215:2		
	<b>chemical</b> 9:10 16:12 18:15 22:13,		

114:23 115:15 116:12,16 <b>clustering</b> 115:5,9,24 117:17 118:7, 10,21 119:3 121:3 <b>clusters</b> 66:21 198:10,11 <b>coated</b> 180:4,20 <b>coating</b> 173:11,17 200:25 <b>Cocona</b> 5:19 14:1,10 214:6 <b>coconut</b> 112:15,20,22 <b>coffee</b> 20:1,4 <b>collaborative</b> 6:25 <b>collapsed</b> 21:18 <b>color</b> 59:5 <b>colorants</b> 60:25 <b>colored</b> 59:5 <b>column</b> 69:22 75:2 178:11,15 179:10,12,13 181:6,7 183:9 <b>columns</b> 187:24 <b>combination</b> 103:10 106:17,18 124:16 173:23 <b>combinations</b> 54:15 56:15 <b>combine</b> 220:22 <b>combined</b> 179:15 <b>combustion</b> 57:24 <b>comment</b> 191:8	<b>commercial</b> 129:23 131:17 <b>common</b> 57:6 59:23 64:7 67:16 218:24 <b>commonly</b> 78:20 79:6 <b>communications</b> 7:9 <b>Company</b> 9:10,11 <b>comparative</b> 98:3,11 <b>compare</b> 159:15 161:1 163:13 167:12,20 169:13 170:10 171:6 215:4 <b>compared</b> 18:22 32:25 33:3,15,17 130:18 143:14 144:9 146:15 147:4 158:24 165:25 169:6 170:22 <b>comparing</b> 162:2 163:15 167:7 <b>comparison</b> 167:16 170:15 <b>comparisons</b> 27:3 <b>compilation</b> 8:5 <b>complete</b> 21:7 67:23 140:5 155:8 <b>completely</b> 60:19 62:5 84:15 <b>complex</b> 139:20 <b>component</b> 7:19 130:3 <b>components</b> 186:13 <b>comport</b> 222:6 <b>composite</b> 177:22 <b>composition</b>	22:18 50:18 134:3 159:17 166:24 167:15 170:13 174:9 181:3 194:19 201:10 214:4 <b>compounds</b> 9:19 70:6,9 170:17 216:10 218:21 219:1,5, 19 222:20,25 223:2 <b>compressed</b> 12:4 <b>comprise</b> 112:6 <b>comprised</b> 108:9 115:14 116:19 184:7 200:15 <b>comprises</b> 110:11 111:17,19 112:15,22 113:10 <b>comprising</b> 110:12,20 140:21 <b>computer</b> 203:11 204:1 <b>concentration</b> 42:4,9,15,19 43:21 50:21 87:3 <b>concerns</b> 193:7,11 <b>conclude</b> 94:16 154:3 170:1 <b>concluded</b> 225:24 <b>conclusion</b> 84:17 100:2 101:6,8,10 120:3,8,24 124:9,23 127:13 129:11 133:25 155:2 157:2 169:25 179:9 186:1 191:25 220:18 <b>conclusions</b> 210:21 222:7 <b>condition</b> 207:14 <b>conditioned</b> 10:24 <b>conditions</b> 166:12 207:16 209:12	<b>confident</b> 193:22 <b>configuration</b> 101:16 119:4 <b>confirm</b> 99:2 <b>confused</b> 128:7 152:19 <b>confusing</b> 16:7 <b>connected</b> 34:5 <b>connection</b> 12:10 50:5 53:4 109:15 110:4 126:10 <b>consequence</b> 225:2 <b>considerably</b> 119:13 169:8 <b>considered</b> 45:21 59:1 132:21 <b>consist</b> 59:6 <b>consisted</b> 201:13 <b>consistent</b> 64:18,20 65:25 76:1 84:10 86:8 88:1,8 157:24 201:15,22 <b>consists</b> 74:22 174:9 <b>constant</b> 45:14 <b>constitute</b> 77:25 <b>constitutes</b> 69:9 77:15,16,23 80:15 81:5 100:20 139:3 140:5 142:21 <b>construction</b> 102:17 103:11 108:18 127:3,13 128:1,12,15,22 129:7,12 130:1,3,18 159:16,21 167:18 170:2 171:8 183:5 186:15
---	---	---	---

<b>constructions</b> 130:17	<b>contrasting</b> 174:1	116:2 118:25 119:16 120:1,22 121:7 122:8,16 123:8 124:20 125:13,23 126:16 127:3,8,10 128:1, 13,14,15 129:7 130:2 131:4,11 132:13 133:20 134:15,22 148:22 149:25 150:15,24 158:21 159:1 160:13 161:7,15 162:11 163:16 164:24 165:10,11 166:8,17 172:16 173:18 174:19 175:3,17 176:6,7, 21 177:1,18 183:12 184:15,20 186:4 205:11 209:7 210:1 211:20,23 213:2 219:5 223:14,17, 20 224:1,6,7,16 225:5,7, 12	<b>counts</b> 10:3
<b>constructs</b> 129:16	<b>Contrastingly</b> 59:14		<b>couple</b> 13:19 98:25 163:4 169:1 195:10 201:8
<b>construed</b> 108:11,14 120:5 129:5 131:20	<b>contributor</b> 134:6		<b>coverage</b> 87:21
<b>consultation</b> 5:15	<b>control</b> 95:13 97:2 156:17 158:10,25 159:1,17,24 160:12 161:6,7 163:23, 25 164:13,15,16,24 165:7,23 166:2,4 168:21, 23 169:6 171:12 177:18 214:25 215:5		<b>coy</b> 33:11
<b>consulting</b> 5:14			<b>cracks</b> 24:9 193:19 225:5,10
<b>consumed</b> 16:10	<b>controlled</b> 31:22 34:20 171:2		<b>create</b> 55:6 57:22 121:4 125:9 149:14 184:25 207:14 217:8,9 220:13,14 225:5
<b>contact</b> 110:17 144:24 187:18	<b>controls</b> 213:15	<b>correction</b> 35:4 119:6	<b>created</b> 17:4,14 23:8,13 101:24 102:4 103:2 184:18 220:10
<b>contained</b> 158:1 210:22 211:5	<b>conveniently</b> 65:16	<b>corrections</b> 225:19	<b>creates</b> 37:6 58:4 183:2 185:6
<b>container</b> 22:7	<b>conversations</b> 8:4,6	<b>correctly</b> 222:24	<b>creating</b> 56:9 58:2,3 99:23 184:6 220:4
<b>contaminants</b> 202:9	<b>converse</b> 218:2	<b>correlations</b> 154:22	<b>creation</b> 100:6
<b>contaminate</b> 202:23 204:10	<b>convex</b> 48:6	<b>correspond</b> 200:7	<b>critical</b> 133:24 154:25 171:10 178:24 179:1
<b>contamination</b> 203:2,16,18	<b>coordination</b> 70:11	<b>Coulter</b> 10:4,6,11	<b>criticality</b> 177:21
<b>contend</b> 207:19	<b>copy</b> 28:14 30:11,20 31:14 91:19 92:1 96:6 108:22 117:2,12,13 178:2 210:3	<b>counsel</b> 6:1,7 7:1 8:9 26:6 28:17 31:12 69:11 78:3,8 81:8 91:17 92:8 95:22 96:5 106:9 110:8,15,23 113:1, 10 116:18 122:20 123:20 131:8 133:14 187:15 191:8 208:3	<b>criticism</b> 157:17 171:23
<b>contention</b> 177:7 183:25	<b>correct</b> 12:11,12,22 13:17 19:1 21:2,12 23:23 34:14 38:15 39:4,13,22 41:23 44:11,21,25 45:1,2 55:14 60:10 63:18 64:8 67:7,9, 14 70:19 74:10 75:15,18 76:19 78:10 85:4,20 86:6,8,14,19,25 87:8,11 88:10,13,18 91:4 92:20 93:10,15,25 94:5,9,20 95:9 96:25 98:7,22 99:9, 18 100:2,12 101:13 102:6 103:23 104:1,13, 17,20,25 106:6,13,23 107:2,7,13 108:7,13 111:25 113:20 114:1,7	<b>Counsel's</b> 122:10 162:15	<b>criticisms</b> 172:14,16
<b>contentions</b> 209:23		<b>counter</b> 10:4,11	<b>cross</b> 18:5 25:19 195:1
<b>contesting</b> 131:10,12		<b>counterpart</b> 49:12	<b>cross-linked</b> 33:21,24 34:4,14 35:13 47:5,6 61:11 65:3 74:23 75:23
<b>context</b> 54:7 79:20 82:23 156:2		<b>counterparts</b> 219:17	<b>cross-linking</b> 76:9
<b>continue</b> 30:7 51:11 62:20		<b>counters</b> 10:6	<b>cross-sectional</b> 27:1,20
<b>continued</b> 109:13			
<b>continues</b> 183:24			
<b>contrast</b> 32:5 43:9 62:22 63:21 208:25			

<b>crosslinked</b> 21:9 46:20 59:15	17,18 77:5,7,17,18 78:2, 9,11,12,16 80:7,10,19 91:21,24 95:25 96:4 109:6,8,9,22,25 126:5,7 138:10,12 141:21,25 142:2,4,14,16,18,25 143:6 145:18,22 148:15 149:4 156:13 162:24 163:1,13,14 173:6 177:3 188:2 190:12 206:7 209:20,24 210:10 215:12,23,25 218:5 219:2,3,24 221:8 222:14 223:8	<b>deduce</b> 146:16	54:22 86:11 93:5 157:19 216:23 220:12
<b>crusty</b> 20:3		<b>deemed</b> 223:22	<b>depends</b> 20:12 36:9 42:3 46:17 51:24 61:3 65:2 89:19 96:21 106:16 116:6 149:16 160:14 172:4 220:9
<b>cubic</b> 137:4 146:23 150:12		<b>deep</b> 24:4 27:7 33:10	<b>depict</b> 87:19
<b>cup</b> 19:25 20:4 96:17 97:9, 13,19,24 162:9 163:23, 25 165:25 166:1,6 169:3, 4 171:13		<b>define</b> 154:24	<b>depicted</b> 24:16 27:25 44:7
<b>cure</b> 185:9 207:16	<b>Daniels'</b> 30:12 31:14 225:20	<b>defined</b> 32:3 135:11	<b>depicting</b> 25:17 27:6
<b>cured</b> 110:10,18 111:17 179:24 180:2,16 181:9 182:9 185:2	<b>data</b> 112:19 117:3,8 150:20, 24 151:2 155:1 169:5 171:11,24 172:22 173:1, 3 194:16 214:24	<b>definition</b> 31:20 53:10,23 54:1,3,6 119:14 133:9 134:11 195:19	<b>depiction</b> 26:21 28:12
<b>cures</b> 181:24 182:12,14	<b>day</b> 134:20 164:14 187:19 208:4	<b>degradation</b> 193:15	<b>deposition</b> 6:3,20 8:18 12:14 13:23 25:5,11,15 26:3 29:22 30:1,12,14,21 31:14 52:24 68:14 69:7 77:13, 21 80:13 81:3 100:18 138:14,21 139:1 142:21 189:17 193:1 201:12 225:24
<b>curing</b> 188:15	<b>days</b> 225:20	<b>degrade</b> 224:16	<b>depositions</b> 13:16,19
<b>current</b> 5:13	<b>deal</b> 156:5 189:15	<b>degraded</b> 193:8	<b>derived</b> 77:24,25 80:16 81:6
<b>curve</b> 44:20 48:6,14 87:4,6	<b>dealing</b> 119:22,23 121:2 209:13	<b>degree</b> 16:13 51:24 55:19 56:6 57:20 72:16 76:8 94:17 115:8 131:13 186:11 206:20	<b>desalting</b> 78:21
<b>curved</b> 199:12	<b>deals</b> 69:22	<b>degrees</b> 15:11 19:6 85:6,15	<b>describe</b> 8:20 106:2 115:14 178:9
<b>custody</b> 191:22,25	<b>debate</b> 176:5	<b>dehydrate</b> 62:24	<b>describes</b> 105:22 106:5 176:20 178:11
<b>cut</b> 195:10	<b>declaration</b> 6:21 12:7,10 14:14 50:5, 11 51:10 53:4 59:11,13 63:12,24 68:12 90:13 99:4 109:15 110:4 121:24 126:10 131:15 136:22 137:24 139:7,14 143:4,24 148:25 149:4 151:3 173:6 179:2 188:5 192:5 194:11 201:12 218:5	<b>dehydrated</b> 62:23 67:13	<b>describing</b> 72:4 107:17 127:20 135:19 174:12 198:11
<b>D</b>	<b>dehydrating</b> 67:9,17 84:6	<b>dehydration</b> 67:9,17 84:6	<b>description</b> 8:22 75:7
<b>D2</b> 29:20 30:7	<b>demarcation</b> 155:9 156:6	<b>denied</b> 190:20	<b>designed</b> 15:20
<b>D570</b> 97:25	<b>denial</b> 55:19 190:9	<b>deodorant</b> 22:5	<b>desorb</b> 41:22
<b>damage</b> 192:15,21 193:19	<b>deconvoluting</b> 83:18	<b>depend</b> 115:18 116:13	<b>desorbed</b> 45:17 46:3
<b>damaged</b> 225:3	<b>decrease</b> 165:18	<b>depending</b> 11:23 18:1 39:23 49:9	
<b>Daniels</b> 5:1,6,11 6:15,17 25:11 31:3,6,10 49:23,25 50:3 52:19,21,25 65:4 68:8,			

<b>desorption</b> 41:7,11 73:17 81:17 82:4 84:2 87:24 88:15	<b>dilution</b> 33:13	<b>discrete</b> 123:18 126:21 127:7	<b>document</b> 7:13,19 12:15 25:10,12, 14,25 26:24 28:25 31:10 50:4,7,13,25 52:23 53:3, 7 55:16 69:7,8,9 70:18 71:5,24 78:5,14,15,17 79:19 80:11,17 81:24 82:20 84:14 89:4 91:11 93:13,17 94:2,7,11,16, 22,24 97:22 98:23 99:11 100:16 106:1,8,10 107:11,15 109:11,14 110:3 113:14 116:24 117:7,10 122:18,20 131:7 132:15 133:6,13 135:14 138:4,24,25 139:5 145:25 148:20 150:2 151:20,21 162:13 168:21 182:23 185:16 186:3
<b>detail</b> 13:22 177:5	<b>dimension</b> 118:19 121:4 184:22	<b>discriminates</b> 31:20	<b>documentary</b> 189:8
<b>detector</b> 213:9	<b>dimensionally</b> 116:17	<b>discuss</b> 167:18	<b>documents</b> 12:20,24 13:10 50:9 78:8 148:10
<b>determination</b> 215:6	<b>dimensions</b> 177:22 178:13 209:17	<b>discussed</b> 128:23 147:17 168:22,24 217:13 219:19 220:24 223:11	<b>door</b> 10:17
<b>determine</b> 194:19 214:15	<b>dioxide</b> 58:21 106:13,23,25 132:6,11,17 133:7,10,19 134:3,8,25 135:10 212:11 216:16 217:20, 21,23	<b>discussing</b> 98:18 100:5	<b>dot</b> 196:9 197:6,8
<b>determined</b> 34:5 48:19	<b>dipole-dipole</b> 70:10	<b>discussion</b> 14:17 15:6 73:9	<b>dots</b> 161:5 197:12,22
<b>determines</b> 76:9	<b>direct</b> 25:9 26:1 68:13 69:5 70:10 77:12,20 80:12 81:2 136:15 138:24 142:20 189:23 207:8,13	<b>disperse</b> 32:19 66:13 217:25	<b>doubt</b> 79:14 82:16,21
<b>develop</b> 9:15	<b>direction</b> 157:12	<b>disperses</b> 17:11 34:12	<b>downs</b> 24:3
<b>developed</b> 9:21	<b>directionally</b> 157:24	<b>dispersive</b> 200:3	<b>draft</b> 7:1,6,22 8:9
<b>developing</b> 9:6	<b>directly</b> 119:20 134:1	<b>dissolve</b> 21:3 42:12	<b>drafts</b> 8:2
<b>devices</b> 10:2	<b>disagree</b> 7:11 79:18	<b>dissolved</b> 17:8 20:7,17 23:2 34:23 40:4,6 42:11	<b>dragging</b> 191:4
<b>dextran</b> 34:14 80:20 82:6 84:24 87:20 93:21,25 94:4	<b>discern</b> 195:17	<b>dissolving</b> 20:10	<b>draw</b> 14:13 50:15 73:21 74:17 78:13 82:25 145:24 156:13 163:21 206:5 210:11
<b>diagram</b> 60:16 183:4	<b>disclose</b> 126:13 131:3	<b>distance</b> 25:2	<b>drawdown</b> 182:1,11 184:18,25 207:16
<b>diameter</b> 24:8 113:6 151:8 153:7, 25 155:14 210:25 211:7, 12 212:17	<b>disclosed</b> 52:15 130:11 132:12 160:16 185:16	<b>distinct</b> 20:23,24 108:10 131:16	
<b>difference</b> 42:4,9,14 43:4,21 60:20 97:12 131:17 146:12 160:18,20 172:8	<b>discloses</b> 144:9	<b>distinction</b> 14:24 39:5,10 103:3 104:5 131:13	
<b>differences</b> 14:17 51:11	<b>disclosing</b> 156:16	<b>distinguish</b> 61:6	
<b>differentiate</b> 199:16	<b>disclosure</b> 123:17	<b>distinguishing</b> 60:19	
<b>difficult</b> 116:15 118:1 129:13 154:10 194:22	<b>discouraged</b> 103:17 221:21	<b>distributed</b> 125:17	
<b>dilute</b> 33:7	<b>discouraging</b> 103:25 107:19	<b>distribution</b> 11:16,19,20 64:6 71:13 146:13	
		<b>division</b> 9:10	

<b>drawdowns</b> 185:9	45:21,25 46:9 71:18 72:16	<b>element</b> 110:16	160:6 174:4
<b>drawing</b> 53:6 69:20 110:6 139:13 165:4 174:25 181:8 183:16 185:5 210:10	<b>dynamics</b> 43:18 72:7	<b>elemental</b> 194:3 199:22 201:9 214:4	<b>enhancing</b> 102:16,20 158:12
<b>dried</b> 65:20 180:1 181:10	<hr/> <b>E</b> <hr/>	<b>elements</b> 200:7,14,15,19	<b>enriched</b> 23:18
<b>dries</b> 181:24	<b>e.g</b> 23:2 64:3 180:3	<b>emanate</b> 202:4	<b>enter</b> 46:3,5 94:14
<b>drive</b> 11:9 62:18	<b>E96-method</b> 98:5,12	<b>embedded</b> 122:16 123:3,7 124:18 125:19,20 220:15	<b>entering</b> 47:7 93:24 94:3,8
<b>driven</b> 42:8 185:3	<b>earlier</b> 26:25 39:12 45:24 72:7 76:16 86:13 137:11 145:11 146:21 168:12 181:19 216:15	<b>embodiment</b> 123:18 151:15	<b>enters</b> 21:18 36:8 75:18
<b>driving</b> 38:25 42:13 43:1,8 49:11	<b>easier</b> 10:10 28:7 198:14 217:24	<b>embodiments</b> 129:23	<b>entire</b> 23:9 30:14 58:7 82:22 108:23,24 170:6 182:23
<b>drop</b> 161:10	<b>easiest</b> 15:22	<b>emission</b> 213:5	<b>entirety</b> 39:9
<b>dropped</b> 168:5	<b>easily</b> 37:9 63:2 75:4	<b>Emmett</b> 10:22	<b>entitled</b> 31:10 68:19 80:19 109:11
<b>dry</b> 60:1	<b>easy</b> 194:25 195:4,16 199:23	<b>employed</b> 10:1	<b>entitles</b> 71:18
<b>drying</b> 57:7 59:25 64:18 65:10 188:16	<b>edge</b> 195:10,15 208:24	<b>encapsulated</b> 218:3	<b>envisioned</b> 71:13
<b>Dryvent</b> 205:4,7	<b>edges</b> 202:21	<b>encourage</b> 104:9	<b>equal</b> 45:16
<b>due</b> 50:18 187:18	<b>effect</b> 167:11,22	<b>encouraging</b> 107:20	<b>equilibrium</b> 42:17,18 43:7,10,13,20, 22 44:3,4 45:12,16 46:1, 11 47:14 71:13,19 74:6,9 81:21 83:2,7,11,17 86:22
<b>duly</b> 5:3	<b>effective</b> 52:2 169:21,24 170:8 172:12	<b>end</b> 15:10,14 16:17 17:8 19:21 20:2,20 24:25 39:12 64:8 66:11 71:11 103:16 118:18 119:11 149:19	<b>equipment</b> 209:4
<b>Dutta</b> 89:24 90:2,17 91:1 92:1 97:18 98:6 99:6,7,16,21 100:3 101:7,9 103:17 104:6 105:6,12,21 107:6, 23 108:3,6 122:2,7,15 124:6,15,16,17 126:20 128:2,16,23 129:7 130:11,17 132:24 173:10 174:21 220:2,22,25 221:21,25 222:5,8 224:12,18	<b>effectively</b> 158:14 159:5	<b>endo</b> 40:20	<b>equivocal</b> 168:13
<b>Dutta's</b> 101:10 123:17	<b>effort</b> 6:25	<b>endothermic</b> 41:12,25 88:18	<b>equivocate</b> 134:20
<b>dynamic</b> 34:3 40:10,12 43:3	<b>electrical</b> 37:7	<b>endpoint</b> 17:13 42:17	<b>error</b> 160:2,19 171:25 172:6
	<b>electrolyte</b> 144:24	<b>energy</b> 43:4 200:3	<b>essence</b> 225:1
	<b>electron</b> 213:6	<b>Engel</b> 69:2	<b>essentially</b> 32:19,24 36:19 42:16 182:14
	<b>elegant</b> 195:22	<b>enhancement</b>	<b>estimate</b> 115:8 116:16

<b>estimating</b> 115:22	6:17,20 12:16 25:4,8 29:22 31:6 49:25 50:3 52:21,25 68:8,11,18 77:5,7,10,17 78:2 80:7 91:21,24 95:25 109:6,22 122:23 126:3,5 138:10, 13,14 141:21,25 142:15, 25 149:4 162:22 209:20 215:25 222:13	<b>expertise</b> 8:23	<b>F</b>
<b>ether</b> 89:8		<b>explain</b> 36:12 43:11 45:5 204:2	<b>fabric</b> 161:4 179:20,23 181:2 195:12,14 196:5
<b>evaporated</b> 180:4		<b>explained</b> 146:12	<b>face</b> 120:18 161:1 210:22 212:24 213:24
<b>evaporates</b> 20:1 182:13		<b>explanation</b> 84:20 102:9	<b>facing</b> 224:3
<b>evaporative</b> 185:24	<b>exhibits</b> 6:14 28:18 138:17 142:7	<b>explicit</b> 130:19	<b>fact</b> 38:21 46:23 104:8 115:4 148:12 149:8 154:9 155:21 159:20 167:21 180:25 195:18 212:20 217:2 224:3
<b>event</b> 187:19 190:9,19	<b>exist</b> 58:11	<b>explicitly</b> 108:4	<b>factors</b> 115:19 116:7
<b>eventually</b> 16:5 36:18	<b>existence</b> 195:18	<b>exposed</b> 125:12	<b>facts</b> 193:10 195:5
<b>evidence</b> 13:10 31:19 189:8 193:10 195:5	<b>exists</b> 32:17 43:8	<b>exposing</b> 123:16	<b>fails</b> 149:8
<b>exact</b> 63:19 66:5 153:15 165:13	<b>exothermic</b> 40:21 41:4,11 87:20 88:12	<b>exposure</b> 57:25	<b>fair</b> 8:22 24:9 26:21 41:10 45:15 53:23 75:7 214:10 224:18
<b>examination</b> 5:3,6 109:13 189:23 215:23	<b>expand</b> 21:19 188:4	<b>expressed</b> 127:25	<b>fairly</b> 15:25 22:16 50:13 72:6 157:24
<b>examined</b> 5:4 13:24 27:19 138:7	<b>expect</b> 37:20 122:13 157:23 160:5 203:14	<b>expressing</b> 137:2	<b>fall</b> 188:7,16,23 206:21
<b>examining</b> 108:16	<b>expected</b> 118:22	<b>extension</b> 217:13	<b>falls</b> 187:8 189:23
<b>examples</b> 54:8 55:21 97:3 129:17 158:24	<b>expects</b> 160:7	<b>extensive</b> 162:19	<b>familiar</b> 28:11 44:16 51:4 52:1 56:11 61:25 62:5 64:22 70:15,19 79:3 82:20 108:21
<b>excerpt</b> 68:18	<b>expenses</b> 190:16	<b>extent</b> 71:4 124:11 140:3 142:24 192:12	<b>familiarity</b> 50:25
<b>exchange</b> 42:25 46:6	<b>experience</b> 147:2 188:15 194:2 207:3	<b>exterior</b> 22:15	<b>farther</b> 21:21
<b>exchanging</b> 47:8	<b>experiment</b> 160:12 165:13,17,19,22 171:17 172:5 194:21 209:9	<b>extra</b> 96:6	<b>fashion</b> 115:25 118:7,10
<b>excitations</b> 200:6	<b>experimental</b> 12:17 84:7 114:23 160:1, 19 166:11 171:21	<b>extraordinarily</b> 120:13	<b>faster</b> 86:22
<b>exclusion</b> 78:21	<b>experiments</b> 156:17 161:5,23 171:2, 13 200:17 201:1	<b>extrapolation</b> 34:11 84:2	
<b>excuse</b> 83:19 124:19 159:8 162:23,24 165:25 166:3, 15	<b>expert</b> 5:18 13:25 14:7 154:21	<b>extreme</b> 55:5 204:9	
<b>exhibit</b>		<b>extremely</b> 102:6 153:10 202:17	
		<b>eye</b> 17:12 21:13	

<b>features</b> 149:21	<b>find</b> 5:19 33:19 132:23 178:3 201:16 204:4 211:3 216:4	73:23 74:2 96:7 183:4	<b>freebie</b> 177:14
<b>Federal</b> 13:9		<b>force</b> 37:7 42:13 43:1,9 49:11	<b>freely</b> 17:15
<b>fee</b> 5:25	<b>finder</b> 5:20	<b>forces</b> 38:25 70:15 220:9	<b>frequencies</b> 83:3,9
<b>feet</b> 15:25 137:12 140:11,12, 13,16	<b>finds</b> 127:18	<b>form</b> 16:20 19:18 37:21 49:9 52:9 58:11 59:24 60:6,9 61:8 62:11 63:3,5,8,14 64:2 75:17 106:16 115:25	<b>front</b> 16:25 109:18
<b>felt</b> 124:6 193:22	<b>fine</b> 30:22 31:16 46:9 49:1 82:7 137:5 141:3 163:7 165:24 177:7 187:17 210:24 212:16	<b>formation</b> 66:25 70:12	<b>function</b> 57:11,13 87:21 101:11 103:12 107:18 133:25 134:12
<b>fence</b> 16:19	<b>finer</b> 63:15 154:8	<b>forming</b> 126:21	<b>functional</b> 37:22 38:23 70:23 127:19 131:17 149:21
<b>field</b> 72:10,14 147:12 197:16	<b>finest</b> 154:9	<b>forms</b> 64:7 219:15	<b>functionality</b> 37:14 64:23 133:5 134:6
<b>fifteen</b> 82:12	<b>finger</b> 47:2	<b>forward</b> 220:17	<b>fundamentally</b> 40:19
<b>figure</b> 43:16 45:25 71:15 84:1, 22 87:19 88:22 96:11 144:17,18 163:1,2,15,21 171:12,22 183:5 196:10 200:4	<b>finish</b> 84:15 163:4	<b>found</b> 82:11 112:4 201:11	<b>fundamentals</b> 161:19
<b>file</b> 108:21,23,24 137:25 139:7	<b>finished</b> 184:22	<b>foundation</b> 25:13 26:5 68:16 69:9 77:15,23 80:15 81:5 100:20 105:5 106:9 119:19 120:6,25 121:9, 11 127:15 128:5,19 129:10,14 130:14 135:13 136:14 138:5 139:2 142:23 144:13 147:21 148:11 150:3,17 154:20 159:12 162:14 168:9 169:24 184:10 185:15 186:8	<hr/> <b>G</b> <hr/>
<b>filing</b> 109:12	<b>finite</b> 34:16,17	<b>fraction</b> 140:16	<b>G-15</b> 82:6
<b>filler</b> 107:20 211:4	<b>fire</b> 56:15	<b>frame</b> 193:5 209:11	<b>G-50</b> 78:20
<b>fillers</b> 56:14 104:19	<b>fits</b> 185:20	<b>frames</b> 190:23	<b>G-SERIES</b> 65:13
<b>film</b> 16:20 19:22,23 23:7,12, 20 103:23 107:9 108:7,8 114:18 122:3 123:1,10 125:11,18 178:13	<b>flat</b> 5:25	<b>frankly</b> 135:7	<b>gain</b> 48:2,7
<b>films</b> 185:9	<b>flexible</b> 40:9	<b>fray</b> 195:13	<b>gas</b> 10:17,24 20:8,9 23:2 53:13,21 54:14 139:19
<b>filter</b> 58:24,25	<b>flexile</b> 177:12	<b>free</b> 18:17,18 43:4 46:19 123:11	<b>gave</b> 224:4
<b>filtration</b> 50:19	<b>flow</b> 63:4		<b>gel</b> 16:21 22:4,5 37:16 38:3, 7,10 47:5 49:17 50:19 57:3,5,6 59:15,21,24 60:4,5,9,12,23 61:8 66:13 67:12,16 70:24 71:1 74:19,22 78:21 80:20 82:6 84:4,24 85:19 87:20 89:7,14 102:12 106:15 150:15 219:10,13
<b>final</b> 43:16 186:1 209:17 225:21	<b>fluid</b> 20:7,10 21:22 32:16,20, 21 39:1 47:18		
	<b>focus</b> 199:25		
	<b>focusing</b> 161:22 167:1		
	<b>follow</b>		

<b>gelled</b> 22:5	<b>gradient</b> 42:19	101:15 107:3 117:23 130:15 143:20 147:14 152:14 153:18,24 154:2, 13 155:8,21 159:14 162:7 174:11 187:12 198:23 216:11	162:11,23 163:14 165:4 166:4,12,16 167:7,13,25 169:2,9 170:18 171:1,11 172:2,14 173:2,10 174:21 176:2,12 177:8, 21 222:11,15 223:1
<b>general</b> 28:8	<b>gram</b> 15:25 16:1 84:3 92:23 93:6,7 137:3,4 138:2 139:21 143:10,22 144:2, 6 146:9,10,24 150:12	<b>guessing</b> 137:22 150:18	<b>Halley's</b> 128:8 134:24 159:16 168:13 172:25 174:6
<b>generality</b> 188:5	<b>grams</b> 17:9 92:23 93:19,20,21 164:3,4,11,12,14,22	<b>H</b>	<b>hand</b> 22:25
<b>generally</b> 45:10 52:6 57:24 152:23, 24	<b>grant</b> 159:2	<b>Haggquist</b> 14:11 25:6 29:22,23 30:11,16 31:9 52:14,16, 24 54:11 55:21 96:3 106:4,25 107:3 109:10 110:1 122:14 124:16 126:1 127:9,18 129:15 130:7,19,20,24 132:12, 18 133:7,14,18 135:11, 17,22,23 138:14 140:18 142:3 144:9 149:24 150:7 159:8,21 161:13 162:9,23 163:22 166:2,5, 14,17 167:13 168:1,18, 24 169:6,7 175:16,21 179:14 193:1 204:20 206:6 209:23 219:7 220:23 222:22,23 223:11,12	<b>handed</b> 6:19 50:2 68:17 78:1 80:18 91:23 109:24 126:7 138:12
<b>gentlemen</b> 69:1,16 80:24 81:11	<b>graph</b> 84:18 85:17 86:4,18,25		<b>handful</b> 215:22
<b>Gergely</b> 5:7 6:13 7:4,10,14,17,20, 25 8:13 13:8 15:3,8 26:6, 14,17 28:16 29:21,25 30:4,9,15,19,23 31:2,8, 17 35:3 48:24 49:2,7,22 52:18 68:5,23 69:11 73:7 77:2 78:3,10 79:25 81:8 96:5 101:17 109:2 121:15,23 126:2 138:19 139:12 141:18,23 142:8, 12,15 145:23 151:22 152:5 163:6,11 182:24 186:20 187:1,11,23 188:8,18 189:5,12,24 190:13,21 191:10,14 206:1,4 208:2 210:4,9 215:9,17 216:3,15 219:22 221:5,10 223:9 225:22	<b>graphed</b> 74:9	<b>hanging</b> 25:4 52:23 96:2 109:8 142:2	
	<b>graphite</b> 52:7,10,15 55:24		<b>handle</b> 153:22 154:10 202:18
	<b>gray</b> 197:2		<b>handled</b> 204:6,12 —
	<b>great</b> 199:18 225:22		<b>handling</b> 202:20 224:15
	<b>greater</b> 114:1,5,6 116:1 117:18 118:12 171:16	<b>Haggquist's</b> 14:20 25:5,15 30:14 31:13 54:7 111:8 137:24 138:20 139:14 143:24 159:12 162:16 165:25 167:6 172:23 192:5 194:11,16 201:11 205:14	<b>hands</b> 63:9 204:7,13
	<b>greatly</b> 146:8	<b>hair</b> 22:5	<b>happen</b> 16:25 36:17 39:7,9 86:9 195:11 204:9
<b>give</b> 22:9 49:14,16 62:14 91:19 117:24 139:22 153:11,24 154:13 216:3	<b>grinding</b> 63:14 67:4	<b>half</b> 14:16 32:21,22,25 93:20 113:25 114:5,14 144:14 150:6 161:11 170:25 178:17 185:21 186:14 198:9 206:22	<b>happened</b> 160:8 192:25
	<b>grossly</b> 200:15		<b>happening</b> 46:2,11,14 91:2 93:9 161:3,9
	<b>ground</b> 6:5 107:22		<b>hard</b> 75:11 150:20 155:1 200:8 204:4
<b>giving</b> 94:13	<b>grounds</b> 6:10 26:15		<b>hash</b> 198:4,6
<b>glass</b> 208:23	<b>group</b> 10:15 37:11,13,22 70:23 158:11 167:17 168:23 197:10	<b>Halley</b> 89:25 90:2 125:22 126:9, 13,25 128:2 130:11,17 131:2,23 132:1,24 133:22 136:2 151:10,23, 24 152:13,15 156:11 158:15 159:8 160:6	<b>hate</b> 170:14
<b>gloves</b> 202:18	<b>grouping</b> 167:11		<b>head</b> 51:8 58:13 95:21 137:20
<b>God</b> 203:25	<b>groups</b> 22:22 38:23 76:11 89:7 168:21,23		<b>heard</b>
<b>Goldilocks</b> 156:4	<b>guess</b> 33:10 37:23 51:24		
<b>good</b> 5:8,9 18:19 33:1 36:3 121:17 203:1			

14:5 76:17	76:10 99:23 100:6,8,10, 22,24 101:1,3,12,16,19, 22,23,25 102:4,10 196:22 197:11,23 220:4, 6 224:16,20 225:5,11	211:7	14:24 17:16 23:25 70:7 127:19 131:12 178:24 179:1,8 192:9,11,23 193:13
<b>hearsay</b> 69:10 77:15,24 80:15 81:5 100:20 139:3 142:21	<b>home</b> 16:1	<b>idea</b> 119:8 148:5	<b>impression</b> 42:23
<b>heat</b> 19:11 41:2,6,24,25 45:14 51:15,22 52:4 55:14 57:21,25 87:19 88:10 185:9 218:16,19,24 223:25 224:5,9,10	<b>homogeneous</b> 20:21	<b>ideal</b> 209:12	<b>improper</b> 167:3 187:2 207:9
<b>heats</b> 83:23 87:23 88:16	<b>homogenous</b> 22:17 125:7	<b>identified</b> 25:10 26:2 68:13 69:6 77:12,21 80:13 81:3 100:18 138:25 142:20	<b>improve</b> 161:21
<b>heavily</b> 34:5 47:5 61:11 65:2	<b>honestly</b> 24:13 26:23	<b>identify</b> 200:7	<b>improved</b> 95:14 161:14 177:16 215:7
<b>held</b> 15:6 32:13 73:9	<b>hope</b> 17:19 20:2 147:22	<b>ignore</b> 166:22 167:21	<b>improvement</b> 95:19 96:25 97:5,6,8 158:25 159:4 160:4,13 161:6 162:1,5 165:1,14, 19 166:1,4 168:3 177:19
<b>helping</b> 196:23	<b>hotel</b> 190:15	<b>ignores</b> 167:14 171:20	<b>improvements</b> 162:10 177:11
<b>hereinafter</b> 5:4	<b>hour</b> 121:16	<b>II</b> 44:17 86:1	<b>improving</b> 102:24 104:7 157:23 168:14 171:15
<b>heterogeneous</b> 20:22	<b>hydro</b> 173:21	<b>III</b> 44:17 85:24 86:2	<b>impurities</b> 59:4 201:19
<b>high</b> 15:24 24:21 52:11 57:25 102:6 131:19 132:20 136:5 143:14,17 144:8, 12,22 147:3,7,15 149:14, 22 151:1 202:15	<b>hydrogen</b> 37:24 38:1,12,25 40:11 70:11,19 71:2 89:7,12, 13,18,19,20	<b>illuminating</b> 17:20	<b>IMS</b> 5:23,24 6:2
<b>high-relevant</b> 149:8	<b>hydrophilic</b> 16:23 18:6 21:6,11 22:4 62:25 90:18 93:19 99:21 101:8 102:1,8 123:2 124:3 173:11,17,23,24, 25 174:9,10,13,16,19,20, 22 175:6,12,19,22,25 176:4 220:3,7,8,12 224:13	<b>illustrated</b> 71:15 83:25	<b>inappropriate</b> 188:1
<b>high-res</b> 198:1	<b>hydrophobic</b> 175:23	<b>image</b> 25:17 26:9 28:20,21,22	<b>inch</b> 112:12
<b>higher</b> 9:16 42:13 56:9 96:20 149:24 161:8	<b>hydroxyl</b> 37:10,13 76:11 89:7	<b>imagine</b> 51:25	<b>include</b> 132:3,5
<b>highly</b> 149:14 217:3	<b>hypothetical</b> 116:4 117:21 118:15 119:2 120:5,25 121:10 128:5,18 129:10 130:13 166:11,19 168:25 171:20 195:5	<b>imbibes</b> 21:19 59:16	<b>included</b> 102:2 103:23 134:4 181:14
<b>history</b> 108:21,23,24 137:25 139:7		<b>impact</b> 167:14	<b>includes</b> 180:24
<b>hold</b> 47:18 61:2		<b>imperative</b> 178:1,10 179:3,6	<b>including</b> 10:2 53:12,20 111:16 129:6 139:18
<b>holds</b> 130:9		<b>imperatives</b> 177:24	<b>incomplete</b> 116:4 117:21 118:15 119:2 120:5,24 121:10 128:5,18 129:10 130:13 140:3 166:11,19 168:25 171:20 195:4
<b>holes</b>	<hr/> <b>I</b> <hr/>	<b>impermeable</b> 123:1	
	<b>i.e.</b>	<b>implication</b> 66:6	
		<b>implying</b> 91:5	
		<b>importance</b> 108:18 133:1	
		<b>important</b>	

<b>inconsistent</b> 124:12 161:11	7:8 145:12 147:11 156:8 170:17,23 172:21 194:1	<b>interacting</b> 37:1,11	<b>introduced</b> 138:20
<b>incorporated</b> 10:2 107:8 154:11	<b>informed</b> 221:13	<b>interaction</b> 17:5 34:22 35:17 36:1 70:11	<b>Introduction</b> 68:19
<b>incorrect</b> 98:24	<b>infringement</b> 205:9 209:22 215:2	<b>interactions</b> 70:2,8	<b>intrusion</b> 11:6
<b>incorrectly</b> 90:12	<b>initial</b> 60:18 64:5 185:6	<b>interacts</b> 35:15	<b>invariant</b> 157:19
<b>increase</b> 18:23,24 157:7 164:6,13, 19,23 165:7 167:21 221:1	<b>initially</b> 42:12	<b>interchange</b> 72:13	<b>invention</b> 10:7 99:6 108:13 122:3, 14 127:20 133:24 221:14,17
<b>increased</b> 161:21 217:9	<b>ink</b> 210:22 211:4	<b>interchangeable</b> 131:21	<b>inventions</b> 220:23
<b>increases</b> 86:5 96:18	<b>inorganic</b> 132:3 139:17 140:22 141:5	<b>interchangeably</b> 90:7,11	<b>inventor</b> 53:9,18 111:6,11 113:1 116:18 120:17 178:9 181:7 205:15 207:19,25 209:16
<b>increasing</b> 103:19 157:25 221:23	<b>ins</b> 24:3	<b>interest</b> 16:11 17:7	<b>inventor's</b> 54:3 110:8,15 117:14 123:5
<b>incurred</b> 190:16	<b>inside</b> 22:20,22 42:10,20	<b>interested</b> 11:11	<b>invert</b> 97:17
<b>independent</b> 50:20 161:23 170:1 196:16	<b>insoluble</b> 21:12,13	<b>interfere</b> 195:13	<b>inverted</b> 96:17 97:9,12,19,24 98:2 163:23,25 166:1,6 169:4 171:13
<b>independently</b> 120:12 161:6 192:24 194:15 195:24 212:5	<b>instruct</b> 186:19,24 188:21 189:3	<b>interior</b> 22:15 28:10 36:16,21 39:8 61:4 65:1	<b>investigate</b> 64:15
<b>indicating</b> 69:17 98:23	<b>instructing</b> 8:14,15 187:2,4,22 190:10	<b>intermediary</b> 36:4	<b>involve</b> 173:10
<b>indication</b> 29:15	<b>instruction</b> 189:15	<b>interpolate</b> 171:5	<b>involved</b> 89:19
<b>individual</b> 22:12 196:13,21 198:12	<b>instructs</b> 6:9	<b>interpose</b> 80:10 207:6	<b>involves</b> 23:9 146:17
<b>industry</b> 140:20	<b>instrumentation</b> 213:13	<b>interpret</b> 129:2 224:23	<b>involving</b> 89:7
<b>inert</b> 104:13,14,15,16,17,18, 20,24 105:3,8,12,14,22, 23 222:1	<b>integrity</b> 193:16	<b>interpretation</b> 132:18,19 157:18 179:7 224:24	<b>ion</b> 200:2
<b>inertness</b> 106:3	<b>intended</b> 29:2 113:8 132:19	<b>interpreted</b> 113:15 127:17 131:20 211:5	<b>ionomer</b> 144:24
<b>infinite</b> 32:6,10 33:2,8,12	<b>intent</b> 134:20 194:23	<b>interprets</b> 128:8	<b>ions</b> 23:1
<b>influx</b> 40:16	<b>intention</b> 134:5,24 162:3 176:10	<b>interrupt</b> 28:14 139:10 182:21 187:16	<b>iron</b> 132:6
<b>information</b>	<b>intents</b> 33:18	<b>intricate</b> 11:23	
	<b>interact</b> 22:23 35:21 37:4 40:25		

<b>Irrespective</b> 135:9	<b>key</b> 99:5	<b>Laminate</b> 191:20	68:23 219:23
<b>irreversibly</b> 84:4	<b>kind</b> 10:17 11:23 12:18 16:12 24:14 38:18 56:23 61:11 71:12 156:8 192:20 200:23 203:16	<b>lampblack</b> 149:13	<b>leave</b> 19:25 129:18 157:10
<b>isotherm</b> 44:8 45:6,13 51:6 74:10 81:20 85:25	<b>kindly</b> 91:19	<b>Lampman</b> 69:1	<b>leaving</b> 47:8 88:16
<b>isotherms</b> 44:11,24 50:19 81:17 83:23,24 84:2,23 85:18, 20	<b>kinds</b> 9:6 192:19 193:19 194:21 195:22	<b>language</b> 133:15	<b>led</b> 221:16
<b>issue</b> 10:7 30:10 89:23 92:16 126:18,24 128:13 204:24 223:10	<b>Klier</b> 80:21	<b>large</b> 25:22 26:10 66:22 75:4 79:19 99:5,13 154:16 155:3,10 156:3 196:13 201:2	<b>left</b> 12:18 73:16,24 74:7 196:17 201:3
<b>issues</b> 169:10 207:9	<b>knowing</b> 171:7	<b>larger</b> 34:10 110:25 111:23 113:24 120:16 146:15 178:18,19 196:19	<b>left-hand</b> 72:9
<b>items</b> 223:22	<b>knowledge</b> 167:4 172:5	<b>laser</b> 9:24	<b>legal</b> 120:3,24 124:9,23 127:12 129:11 157:1 169:25 191:25
<b>iterations</b> 162:21	<b>Kriz</b> 69:1	<b>late</b> 127:12	<b>length</b> 18:5
<b>IUPAC</b> 58:7	<hr/> <b>L</b> <hr/>	<b>lawful</b> 5:2	<b>lengthier</b> 78:16
<hr/> <b>J</b> <hr/>	<b>lab</b> 9:8 67:21,22 205:1,11	<b>lawyer</b> 85:13	<b>lengths</b> 74:4
<b>jacket</b> 204:16	<b>labeled</b> 133:3 209:23,24	<b>lay</b> 114:18 118:1	<b>lengthy</b> 50:13
<b>Jacob</b> 215:11	<b>laboratory</b> 9:4 11:5 68:20	<b>layer</b> 23:15 108:13,19 115:11, 14 117:18 118:11 124:7, 19 129:3 130:1,4 167:5 181:25 182:9,10,12,14, 17,18 183:3,6 184:3,7, 13,17,19,20,21,23,24,25 185:4 194:20 196:4 206:15 207:20 210:22 211:4 220:15	<b>level</b> 36:25 43:19 45:22 46:9 60:4 61:4,15,16 96:21 97:2,6 154:25 171:23 172:15 206:16 220:11
<b>jar</b> 60:1	<b>labs</b> 209:4	<b>layered</b> 124:1 125:3	<b>levels</b> 171:5
<b>judge</b> 88:7	<b>lack</b> 172:20 173:3,4 185:15 196:24	<b>layers</b> 108:20 123:18 126:21 127:7 177:23 185:22 194:9 195:2,18 204:22 209:7 214:6	<b>lie</b> 156:6
<b>judgment</b> 117:24	<b>lacks</b> 25:12 26:5 68:15 69:9 77:14,23 80:15 81:5 100:19 105:5 106:9 119:19 120:6,25 121:9, 11 127:15 128:5,19 129:10 130:14 135:13 136:14 138:5 139:1,2 142:23 144:13 147:21 148:11 150:3,17 154:20 159:11 162:14 168:8 169:24 184:10 186:7	<b>laying</b> 115:5 118:6 184:1	<b>light</b> 9:24
<hr/> <b>K</b> <hr/>	<b>laid</b> 118:9	<b>leading</b>	<b>likelihood</b> 62:24
<b>K-ALPHA</b> 200:11			<b>likes</b> 35:16 199:10
<b>Kellerman</b> 80:21			<b>likewise</b> 175:19
<b>Kelvin</b> 85:3,6			<b>limit</b> 32:3 190:10 208:10
			<b>limitation</b> 110:23

<b>limitations</b> 188:11	<b>loadings</b> 96:20	<b>M</b>	6:17,19 25:4,14 29:21 31:6,9 49:25 50:2 52:21, 24 68:8,17 77:5,7 78:1 80:7,18 91:21,23 95:25 96:3 109:6,8,9,22,24,25 126:5,7 138:10,12,13 141:21,25 142:3,4 206:7 209:20
<b>limited</b> 103:5 108:12 173:1 208:8	<b>loads</b> 164:21	<b>macropores</b> 12:1	<b>mass</b> 11:12 15:10 17:21,22 18:8,9,20,24,25 19:2
<b>limiting</b> 48:21	<b>locate</b> 117:10	<b>macroscopic</b> 225:8	<b>masses</b> 84:19
<b>linear</b> 50:19 51:6	<b>location</b> 101:15 102:9 200:10	<b>macroscopically</b> 59:18	<b>material</b> 15:17 16:1,4,10,18,24 18:5 24:23 36:24 39:9 45:17 46:2,3,5,10 49:14 52:10 55:18 56:7 57:14, 16 58:5,10,15 60:12 61:14 63:25 66:14,18,22 67:4,24 71:12,14 72:22, 23 74:23 75:15 76:13 84:10 86:11 88:16 91:7 92:5 93:6,9 102:8 110:11,19 111:17 132:21 133:2,3 134:4,7 137:3 139:17 140:22 147:24,25 148:8 149:15 157:6 158:1 159:20 160:5 161:20 167:5 169:19 173:24,25 174:11 175:7, 12,16,24 176:3,5 177:9 179:24 191:19,23 193:6, 17 195:1 196:25 197:21, 22 198:21,24 201:21 202:18 203:19,22 215:5 224:3,8,15 225:3
<b>lines</b> 69:13 123:23 156:6 174:25 182:25 183:9 184:14	<b>logic</b> 130:9	<b>made</b> 24:13 114:17 131:14 146:17 178:12 192:2,3,4 193:2 204:18 219:16	
<b>linkages</b> 89:8	<b>logical</b> 37:24	<b>magnesium</b> 201:7	
<b>liquid</b> 18:3 20:7 23:2 33:14 34:23 35:14 36:11 41:1 53:13,21 54:14 58:11 59:16 75:17 79:11 139:19	<b>long</b> 17:19 42:19 43:20 47:18 56:4 86:3 134:21	<b>magnification</b> 193:21 197:7	
<b>liquid-impermeable</b> 110:10,18	<b>looked</b> 27:11 28:24 125:1 132:23 143:25 148:21 176:25 205:12,14	<b>magnitude</b> 19:2,5 110:25 111:23 112:1 113:19,24 114:7, 14 178:19 186:15	
<b>list</b> 12:7,25 58:5 59:1 131:23 133:18 135:16,19 218:21 223:21 224:8	<b>loose</b> 34:9	<b>major</b> 95:15	
<b>listed</b> 13:15 106:25 216:11 219:1	<b>loss</b> 185:24	<b>make</b> 63:21 103:3 104:4 115:1 135:18 160:9 170:7 176:1 178:12 187:20 192:13 202:22 208:8,12 214:15 215:6 217:22 224:1,16 225:19	
<b>lists</b> 55:21,24 106:20,23 133:19 222:20	<b>lost</b> 178:2 210:3	<b>makes</b> 36:20 56:7 177:21	
<b>liter</b> 32:22 33:1	<b>lot</b> 8:3 17:14 18:10,11,24 20:14 27:20 50:25 145:11 158:9 169:17 170:23 208:3 217:23	<b>makeup</b> 59:8	
<b>literally</b> 131:18	<b>lots</b> 36:3	<b>making</b> 6:7 61:14 82:23 111:11 135:8 157:16 176:8 185:8 217:24 224:20	
<b>literature</b> 44:14 136:10,13 176:19, 24	<b>loves</b> 16:24	<b>manner</b> 27:7	
<b>living</b> 5:12	<b>low</b> 147:15 149:19 151:1 203:3	<b>map</b> 200:9	
<b>loaded</b> 168:15	<b>lower</b> 96:23 157:14 158:11 159:7,11,25 197:7	<b>mark</b> 6:13 29:20 30:1 49:22 52:19 68:5 109:3 126:3 141:18 198:5,6	
<b>loading</b> 96:24 159:6	<b>lump</b> 19:21	<b>marked</b>	
	<b>lunch</b> 121:16		

<b>math</b> 113:17,21	<b>mechanism</b> 36:7 38:13 39:2 49:11 89:5,12,13,17 101:6	143:10,21 144:1,3,5 146:8,9	<b>microscopy</b> 213:6
<b>matrix</b> 36:8 38:5,20 40:1 76:10	<b>medium</b> 147:15 151:1	<b>method</b> 11:6 96:18 97:9,13,18, 19,20,23 98:16 99:1 123:24 124:1 125:7 162:9 163:23 166:1,6 169:4 171:14 207:13 208:18 214:17	<b>microwave</b> 67:18
<b>matter</b> 7:21 8:7 66:12 173:11,23	<b>meet</b> 65:1 188:10	<b>methods</b> 9:7,15,24 10:1,11,16,18 52:6	<b>middle</b> 19:16 24:10
<b>matters</b> 5:16	<b>meeting</b> 215:12	<b>metric</b> 137:2	<b>mil</b> 112:7,11 180:6,14,22 181:12,22 182:10,12 184:15,18,19,20,23,24, 25 185:4,6 206:10,12 207:15 208:19 209:14
<b>maximum</b> 170:25	<b>meets</b> 107:23	<b>metrics</b> 11:14	<b>milligrams</b> 84:3
<b>meaning</b> 96:15 105:13	<b>melting</b> 58:12	<b>mica</b> 132:7	<b>mind</b> 212:23 213:22
<b>means</b> 33:13 45:14 63:6,11 74:5 83:4,16 105:14 112:1 116:10 118:25 119:14, 21,25 120:20 121:6,9 153:22	<b>membrane</b> 99:23,24 100:25 101:5, 13,20,24 102:2,3,5,14 112:6,14 158:17 161:5 170:3 173:24 174:23 175:3 180:4,5,13,14,20, 21,24 181:2,12,22 182:2 183:11 184:13,15 206:10,11 208:16 220:4, 5 224:20 225:11	<b>micro-pores</b> 146:18	<b>mine</b> 127:22
<b>meant</b> 51:1 91:6 105:12	<b>membranes</b> 181:7,9	<b>microfilm</b> 79:11	<b>minerals</b> 201:22
<b>measurable</b> 134:12	<b>mention</b> 177:21	<b>micrograph</b> 196:20 197:1 198:1	<b>minutes</b> 191:6 215:15
<b>measure</b> 9:7,22 10:23 11:14,19 18:14,17,20 29:15 137:13 148:12 185:25 186:9 192:20 195:1 207:17 208:16 209:6,14 214:14,17	<b>mentioned</b> 14:6 38:1 43:12 45:25 76:16 86:13 89:14 169:10 179:10 219:14	<b>micron</b> 119:7,9,22 153:17	<b>mischaracterizes</b> 99:11 105:16 106:8 107:11,15 113:14 116:24 122:18 126:23 127:14 131:7 132:15 133:13 135:13 138:4 148:19 150:2 151:19 153:4 159:12 161:17 162:13 168:20 172:18 183:14 186:7
<b>measured</b> 10:14 24:6 44:7 68:2 88:5 120:11 147:24 153:15 207:19	<b>mentions</b> 108:17	<b>microns</b> 24:8 112:7,11,23 113:3, 18,22 116:2,8,20 117:16, 19 118:10,12,19,20 119:24 120:9,15,20 121:2,5 155:17 198:4,6	<b>mischaracterizing</b> 55:16 120:4
<b>measurement</b> 18:16 24:14 154:1 214:12,16	<b>mercury</b> 11:6,9	<b>micropores</b> 11:25	<b>misconstrue</b> 130:23
<b>measurements</b> 9:17 27:20 160:15,24 172:7,24 214:8	<b>mesopores</b> 12:1	<b>microporous</b> 170:5	<b>misinterpret</b> 130:24
<b>measuring</b> 9:14 10:3 162:10	<b>met</b> 12:21 14:3 118:24 119:15,25 120:22 121:5, 7 194:12 195:25	<b>microscale</b> 68:20 100:9	<b>missed</b> 213:16
<b>mechanical</b> 63:6,11	<b>metal</b> 132:4	<b>microscope</b> 24:18 129:18 192:22 193:21 195:9 208:21 209:3	<b>missing</b> 159:14
<b>mechanically</b> 67:3	<b>meter</b> 140:16 164:14	<b>microscopic</b> 101:2,3	<b>mistaken</b> 42:23 203:20
<b>mechanics</b> 185:5	<b>meters</b> 138:2 139:21 140:14,15	<b>microscopically</b> 16:16 59:17	<b>misunderstanding</b> 93:18

<b>mix</b> 209:10	46:24	19:9	<b>North</b> 210:22 212:23 213:24
<b>mixed</b> 126:20 174:11	<b>motionless</b> 40:5	<b>natural</b> 52:9 201:21 223:13	<b>notebooks</b> 205:15,16
<b>mixing</b> 92:6	<b>motions</b> 46:23	<b>naturally</b> 51:19,21 55:3,13,18 58:17,21 216:20	<b>noted</b> 191:8
<b>mixture</b> 141:9 179:20 180:1,10, 15,19 181:4,8,15,18,23, 24 183:16,20,23 207:14	<b>motivated</b> 220:22	<b>nature</b> 18:6 19:24 60:15 106:3 217:10	<b>notice</b> 25:11 26:3 68:14 69:7 77:13,21 80:13 81:3 100:18 139:1 142:21 200:18 201:9
<b>model</b> 82:5 87:10 118:8	<b>move</b> 17:14 22:21 40:8 46:20 47:1 75:2 99:24 101:20 103:14 191:2 220:5	<b>near-infrared</b> 82:3	<b>noticeable</b> 16:13
<b>modest</b> 96:18 164:6	<b>movement</b> 72:21 73:25	<b>necessarily</b> 93:8 108:12 127:7 134:4 135:3 153:1 190:22	<b>number</b> 6:20 9:23,25 15:24 31:1 114:25 115:19 116:6,13 117:1 121:2 140:9 154:12 167:3 169:4,5 171:3 175:4 197:19 216:10
<b>modified</b> 217:8	<b>moves</b> 18:11 102:25	<b>network</b> 21:17,19,23,25 22:1 34:1,7,9,11	<b>numbers</b> 85:8 149:3 155:8 157:8 161:1,25 162:6,7,17 170:10 210:14
<b>moisture</b> 15:21 20:25 37:19 60:2 102:16,18,21 161:22 167:11,23 174:3 194:13	<b>movie</b> 17:20	<b>networks</b> 42:22	<b>numerical</b> 150:4
<b>molecular</b> 17:3 36:25 43:19 45:22 46:22 58:24,25 59:3,9 60:3 61:4,16 82:10 220:11	<b>moving</b> 16:25 46:19 73:15,17,22 220:17 221:25	<b>newer</b> 213:12	<b>nylon</b> 179:20,23 181:2 209:10
<b>molecule</b> 34:6 36:15 38:22 40:7, 10,12 46:7 47:3 72:16 74:1	<b>MPL</b> 146:16	<b>nice</b> 15:25 215:12	<hr/> <b>O</b> <hr/>
<b>molecules</b> 17:6,14 21:20 23:1,19,22 25:23 26:11 32:18,24,25 34:4 35:19,21 36:1,14,21 37:1,8,21 46:25 47:7,10 64:25 73:13,22 74:24 75:1,3 89:6	<b>MSDS</b> 104:24	<b>nitpicky</b> 35:8	<b>object</b> 25:8 38:6 45:7,18 46:13 53:25 54:5 55:15 68:10 69:3 77:10,18 100:14 124:11 138:23 142:18 219:23
<b>moment</b> 73:6 122:22 129:19 132:25 157:11 216:9	<b>MTVR</b> 96:14	<b>nomenclature</b> 30:8	<b>objection</b> 6:12 7:2 8:10 13:2 24:11 25:24 26:7,15 27:8,16 29:8 34:25 39:17 40:2 69:12 70:17 71:3,23 72:24 73:18 74:11 75:9 76:2,22 78:4,25 79:16 80:10,25 81:9 82:18 83:5,14 84:12 85:21 87:12 88:2,19 89:9,15 90:8 91:16 93:16 94:1, 10,23 97:21 99:10 101:14 103:7 104:2
<b>monolayer</b> 114:19 115:6,10,11 118:1	<b>multiplicity</b> 114:25	<b>nominal</b> 148:3	
<b>morning</b> 5:8,9 100:5 137:12	<b>MVTR</b> 96:15,19 156:21 157:14, 18,23 158:12,25 160:11 161:14 162:10 168:5,15 171:14 177:16 214:23 215:7 225:12	<b>non-absorbent</b> 221:22 222:1	
<b>morphed</b> 10:12	<hr/> <b>N</b> <hr/>	<b>non-polar</b> 70:6	
<b>motion</b>	<b>naked</b> 17:12 21:13	<b>nonabsorbent</b> 103:18 104:7,11,12	
	<b>named</b> 14:1	<b>nonactivated</b> 223:1	
	<b>nanometers</b> 143:11 151:17 152:2,10 155:11,18,19,22 210:25 211:7,12,23 212:17,22	<b>noncrosslinked</b> 32:14	
	<b>native</b>	<b>Nonetheless</b> 124:6	
		<b>nonpreferred</b> 128:22	
		<b>normal</b> 52:13 160:1	

105:2,5,9,15,25 106:7 107:10,14 113:13 115:16 116:3,23 117:20 118:14 119:1,17 120:2,23 121:8 122:9,17 123:19 124:8, 22 125:4,14 126:22 127:11 128:4,17 129:9 130:12 131:5 132:14 133:12 135:12 136:12 138:3 139:11 140:2 143:16 144:11 145:9 147:5,19 148:9,18 150:1, 16 151:12,18 152:17,25 153:3 154:6,18 155:5,12 156:23 158:5 159:3,10 161:16 162:12 166:7,10, 18 168:6,19 169:22 171:19 172:17 173:19 176:22 177:3 178:25 180:17 183:13 184:9 185:13 186:6,17 187:20 189:2,9,14 191:24 192:10 193:9 195:3 207:7,22 213:25 224:21	161:9 <b>odds</b> 118:17 <b>Oelker</b> 136:21 149:7 <b>Oelker's</b> 50:10 157:17 <b>offer</b> 190:22 <b>offered</b> 187:24 <b>offering</b> 186:21 <b>offers</b> 144:23 <b>one's</b> 85:12 172:12 <b>one-off</b> 160:24 <b>operate</b> 141:5 <b>operates</b> 173:12 <b>operative</b> 89:17 <b>opine</b> 187:6 211:19 <b>opining</b> 188:3,22 <b>opinion</b> 127:22 187:24 194:3 207:1 <b>opportunity</b> 139:5 <b>opposite</b> 41:7 86:24 <b>optimum</b> 156:7 <b>oranges</b> 159:15 167:8,16 170:15 <b>order</b> 14:24 21:2 22:23 110:24 111:23 112:1 113:19,24 114:6,14 122:25 139:21 151:16 164:9 169:14	178:6,19 186:14 211:15 <b>orders</b> 19:5 <b>ordinary</b> 27:5 59:24 60:6,9 61:8 71:25 83:12 115:2 118:5, 23 147:2 176:18 177:15 219:11 220:19,21 221:15 <b>organic</b> 25:23 26:11 62:9 68:19 70:8 100:9,16 139:16 140:21 141:4 <b>organize</b> 215:16 <b>origin</b> 212:21 <b>original</b> 19:18,23 20:5 30:10,17 31:13 41:21 62:11 63:3 64:2,12,17 65:7,20 66:1, 4,5,16 67:5,14 84:11 182:2 192:14 <b>out-of-pocket</b> 190:15 <b>outcome</b> 167:2 186:2 <b>outer</b> 24:1 29:10 <b>outermost</b> 29:16 <b>outs</b> 24:3 <b>oven</b> 67:18,19,21,22,23 180:2 181:10 <b>overcapacity</b> 43:2 <b>overcome</b> 111:7,12 <b>overruled</b> 187:20 <b>oxide</b> 51:14 56:10 132:6,7 135:21 210:23 212:8 218:15 <b>oxides</b>	132:4 <b>oxidized</b> 202:3 <b>oxygen</b> 37:13,21 38:23 55:6 106:18 201:4,24 202:2,6, 12 <b>oxygens</b> 202:10 <hr/> <b>P</b> <hr/> <b>p.m.</b> 225:24 <b>pack</b> 116:12 <b>packaging</b> 192:14 <b>packets</b> 59:24 <b>pages</b> 14:16 98:18 <b>paid</b> 5:25 6:2 <b>paper</b> 81:13 181:9,11 183:17 <b>paragraph</b> 14:14 15:9 31:18 35:5 40:17 53:6,14,15,17 54:9 55:20 59:12 62:7 63:24 65:10 71:12 82:2 84:21 90:13 94:21 98:8 99:3 100:22 103:16 107:21 112:5,13 121:24 126:12 139:13 140:4,5,18 149:4 152:12 173:9 176:8,16 177:20 193:25 196:2,11 209:18 216:7,11 217:13, 19 218:4,9,21 219:1 220:18 221:8,12,20,25 222:6,19,21 <b>parameters</b> 79:4 185:21 <b>parentheses</b> 113:9 <b>parenthesized</b> 58:6
--	--	--	--

<b>part</b> 23:24,25 79:5 114:22 117:23 130:23 135:7 153:24 154:14,24 155:9 173:4 179:24 201:18  <b>partial</b> 87:2,16  <b>partially</b> 122:16 123:3,7 124:18 125:19  <b>participating</b> 89:6  <b>particle</b> 9:5,14,17,22 11:17,18,19 15:16 16:11 17:1,2,3,23 18:8,12 19:9,21 23:16,23 24:5,25 25:19 27:2 52:8, 15 54:22 55:24 57:8 60:4 64:5,6 66:1 99:5 102:12 106:6 107:2 112:21 113:2,10 116:8 117:18 118:11,21,25 119:15,18, 21,22,25 120:4,9,11,17 121:6,10 125:12 130:9 131:18 132:12,22 133:10,20,24 134:6,10, 11 135:6,10 136:2 139:16 140:19 141:5,7,8, 10 143:11 146:14 147:17 152:2 153:14 154:15,17, 21 155:16,22 157:7 158:16 159:6 196:7,8 199:9,14 202:4 217:17  <b>particles</b> 8:24 10:13,25 11:15 12:3,5 24:15 29:14 37:15 38:2 51:13 53:10,18,24 54:12 55:2,4,12,22 58:4 59:17 90:18 91:8,13,14 92:18 94:8,17 99:8,17,22 100:11,24 101:9,13,23 102:1 103:18,23 104:1,7, 9,11,12 105:7,22 110:17, 19 111:18 114:16,24,25 115:12,15,23 116:1 118:6,9 120:15 121:3 122:14,16 123:2,11,16 124:3,18 125:2,10 126:13,17 129:6 131:2,3, 6 132:2,5,6,11 133:23 135:17,24,25 138:1 139:20,22 140:21 143:25 149:25 150:14 151:11	165:6 177:17 196:3,10, 16,21 197:10,18,25 198:10,25 199:8,11 200:13 201:13 210:23,24 211:4,6,8 212:8,16,20, 21,25 213:10,23 216:22 217:12,14 218:14 219:8, 9 220:3,7,8,12 221:1,22 222:1,9 223:22 224:14  <b>particulars</b> 117:16  <b>particulate</b> 60:15 62:11 63:3 64:2 132:1,2,3,5 173:13,22 177:9  <b>particulates</b> 174:6  <b>partition</b> 50:19 51:6  <b>partners</b> 46:6  <b>parts</b> 9:12 161:11 170:25  <b>passage</b> 92:9 99:12 123:21 124:4, 25 131:8  <b>passages</b> 101:4  <b>passageways</b> 101:4  <b>passing</b> 14:7 17:1 47:7  <b>passively</b> 170:4  <b>past</b> 57:1 82:11  <b>patent</b> 14:21 52:16 95:20 96:2,8 103:4 104:10 106:5 107:1 108:5,17 109:3 114:8,11 120:21 127:9, 17,23 128:9 129:15,20 132:18 133:9 139:8 159:22 160:16 163:13,22 168:18,22,24 169:2,7,9 170:19 171:1,3,24 172:1, 2,16,22 177:24 178:1,8 193:3 194:5,13 206:6 217:14 219:18 223:11	<b>patents</b> 14:22 63:2 102:25  <b>pattern</b> 196:3,10  <b>Pavia</b> 69:1  <b>pay</b> 190:14  <b>peak</b> 203:3  <b>peaks</b> 200:4  <b>Pearl</b> 143:9 144:4 145:2,13  <b>Pearls</b> 136:1,4,7,9,17 145:7 146:10,14,17,22 147:12 148:4,7,16 149:23 150:5, 11,22 151:15 153:2,5 155:14,15,24 156:18 169:20 174:12,15 175:11 176:3,20 177:6,17 211:22,25 212:3  <b>peculiarities</b> 157:6  <b>pedestrian</b> 219:17  <b>pellet</b> 16:22  <b>pending</b> 68:22 158:6  <b>penetrate</b> 23:22 29:17 36:16 74:25 75:3  <b>penetrates</b> 60:3,4,19 153:13  <b>penetrating</b> 29:5  <b>penetration</b> 25:1 47:21 64:25  <b>people</b> 62:3,4 90:10 204:12  <b>percent</b> 95:16,18 157:7 158:18 164:9,18,19 165:1,5,10, 14,22 169:15 172:6,7	<b>percentage</b> 158:15,17 165:6 166:14, 16 167:20 169:18  <b>percentages</b> 159:7  <b>perfect</b> 114:19 115:11 118:1  <b>performance</b> 156:7 158:13  <b>performed</b> 66:2  <b>perimeter</b> 23:22 29:5,9,10,14  <b>permeate</b> 75:1  <b>permissible</b> 187:9  <b>person</b> 27:5 83:12 115:1 118:4, 23 147:2 176:18 177:15 219:11 220:19,21 221:15  <b>personal</b> 71:25  <b>pertinent</b> 12:20  <b>Peter</b> 28:14 139:10  <b>petition</b> 50:8 107:23 136:21  <b>Petitioner</b> 5:2  <b>petitioner's</b> 6:17 31:6 49:25 52:21 68:8 77:5,7 80:7 91:21 95:25 109:6,22 126:5 138:10,17 141:21,25 142:7 209:20  <b>Pharmacia</b> 82:7  <b>phase</b> 74:22 75:2  <b>phases</b> 54:14  <b>phenomenon</b> 17:18 36:22 118:22 156:4
--	--	--	--

<b>phone</b> 190:7,8 205:20	<b>plurality</b> 110:16,19 111:18 114:24	<b>polyurethane</b> 91:13 92:7 93:10,24 114:17 115:24 173:17 174:10,18,20 175:17 176:2 179:14,19 180:10, 15,18 181:5,20 183:11, 21,22 184:1,3,7	<b>position</b> 127:6 153:20 174:6
<b>phonetic</b> 14:2	<b>point</b> 15:17 16:17 21:20 28:7, 24 32:18 33:11 34:1 42:18 47:2 53:14 58:12 62:17 63:7,20 92:9 94:12 123:21 131:14 143:19,23 147:8,14 154:8 157:16, 22 159:14 160:8,23 168:16 176:8,10 183:4 187:5 194:20 196:8 198:3 204:7	<b>polyurethanes</b> 175:8	<b>positions</b> 47:8
<b>phosphorus</b> 201:5 203:10	<b>pointed</b> 160:10 199:4	<b>poor</b> 36:4 157:14	<b>possession</b> 144:22
<b>photographs</b> 197:4	<b>pointing</b> 28:19,21 196:22	<b>populations</b> 11:22	<b>possibly</b> 61:2 129:5
<b>physical</b> 16:20 19:24 33:25 36:22 62:11 63:5,7,15 64:2 146:4 149:21 151:7,9 177:12 194:19	<b>points</b> 15:10,14 169:5	<b>pore</b> 11:2,3,4 26:22 31:23 34:20 48:21 75:18 136:25 137:2,8,15,17,21 146:13,15,21,22 147:4,9, 12,16,20,23 148:1,2,12 149:17,22 150:10,11,13, 19,23 154:22 197:2 199:5	<b>postulated</b> 38:10
<b>physically</b> 20:5 32:13 64:9 104:18	<b>polar</b> 37:8,20 70:8,22	<b>pores</b> 11:10 12:5 16:2 23:24 24:4,22,24 27:7,14,23 28:1,4,6 36:8 37:2,4 38:12,14 39:7 44:1 54:12,20 55:3,7,17 56:6, 7,18 57:19,22 58:2 60:11 100:11 196:24 197:3,11, 13,14,23,24 198:12,17 199:3 216:25	<b>potential</b> 202:5
<b>pick</b> 15:24 201:21 202:21	<b>polarity</b> 37:7 38:12	<b>porosity</b> 11:7	<b>potentially</b> 16:9 139:3
<b>picked</b> 214:8	<b>polyacrylic</b> 59:15	<b>porosimetry</b> 11:7	<b>powder</b> 16:21 58:10 144:22 146:5
<b>picking</b> 214:11	<b>polyesters</b> 175:8	<b>porosity</b> 11:16 56:17 217:9	<b>powdered</b> 112:15,20,22
<b>piece</b> 66:11 143:20 196:5	<b>polyethers</b> 175:8	<b>porous</b> 29:4 51:14 57:15 60:9 75:1,3,15 148:8,14 149:14 175:3 217:3 218:15	<b>practice</b> 57:6 141:16 189:18 194:4
<b>pieces</b> 7:19	<b>Polyethylene</b> 175:3	<b>portion</b> 5:16 27:22 28:10,22 83:8 133:24 180:2	<b>practices</b> 208:9
<b>pigments</b> 132:4	<b>polymer</b> 5:15 8:20 22:4 34:22 36:1 40:20 41:1 43:5 76:10,12 123:1,3 124:2 125:3 175:7,13	<b>portions</b> 108:25	<b>Precisely</b> 10:5
<b>pile</b> 115:20	<b>polymeric</b> 74:23 75:22 76:4	<b>POSITA</b> 99:20 149:5 173:9 188:15 189:10 220:2	<b>precision</b> 9:16
<b>pink</b> 201:3	<b>polymers</b> 21:7,11 175:6		<b>precured</b> 185:6
<b>place</b> 21:8 45:11 46:23,24 147:12 150:25 157:8 220:13	<b>polysaccharide</b> 35:18 76:5		<b>predisposes</b> 148:13
<b>places</b> 35:20 40:9	<b>polysaccharide-like</b> 38:22		<b>predominantly</b> 10:16 11:5 37:23
<b>platinum</b> 200:22,23,24	<b>Polysaccharides</b> 76:5		<b>preexisting</b> 52:19
<b>play</b> 222:1			<b>preferably</b> 65:17
<b>played</b> 58:1			<b>preferred</b> 123:24 125:7 128:24,25 132:1 151:14
<b>playing</b> 104:3 203:11 204:1			<b>prepare</b> 12:21
			<b>prepared</b> 6:24

<b>preparing</b> 12:14	<b>privilege</b> 6:11 7:3,9,11 8:11 13:5 189:20	127:20 149:13 183:6 186:2,13 212:24 213:24 225:9	<b>published</b> 212:5
<b>presence</b> 56:5 127:1 193:18	<b>privileged</b> 13:11	<b>production</b> 9:20	<b>pulverizing</b> 63:13,14 64:4 67:3
<b>present</b> 11:22 96:13 203:15,17 211:9	<b>problem</b> 149:3	<b>products</b> 57:23,24 59:25 191:18 205:5,8	<b>pure</b> 79:5 116:15 117:23 154:23 171:6 203:8
<b>presented</b> 84:20 96:23	<b>problems</b> 224:14	<b>promote</b> 102:13	<b>purely</b> 60:20,21
<b>pressure</b> 87:2	<b>procedure</b> 65:21 66:6,24 67:6,17 98:19	<b>proof</b> 120:10	<b>purification</b> 82:12
<b>pressures</b> 87:16	<b>procedures</b> 82:13	<b>properties</b> 134:15,19,21 135:15 144:21 145:12 146:4 177:12 192:19	<b>purported</b> 209:7
<b>pressurized</b> 11:9	<b>proceed</b> 31:21 160:3 187:12 209:14	<b>propose</b> 104:6	<b>purpose</b> 103:18 134:14,20 135:2, 9 177:10 221:23
<b>presumption</b> 183:3	<b>proceedings</b> 207:10	<b>proposing</b> 89:5	<b>purposes</b> 33:18 65:8 133:11 219:18
<b>presupposes</b> 169:16	<b>proceeds</b> 42:3 86:14	<b>protected</b> 179:18 182:5	<b>put</b> 17:24 20:16,18 30:19 31:3 32:22 39:20 51:9 52:25 56:24 67:17,21,22 114:17 115:23 119:10 157:13,20 168:2,4 171:18 193:20 208:24
<b>pretty</b> 130:19 148:13 152:20 153:9 197:7 199:23	<b>process</b> 7:5,21 16:3 20:6 21:8 23:1,7 31:22 39:6 40:10, 13 41:11,24 42:8 43:13, 24 45:11 60:18 62:8,16 66:3,12,20 67:25 72:8,15 74:6 88:12 100:7 115:19 129:16 141:8 184:11 209:15	<b>protecting</b> 217:25	<b>puts</b> 93:6 104:10
<b>prevent</b> 66:24	<b>processed</b> 149:7 151:4 152:8 154:4, 16	<b>protective</b> 179:15 180:3 183:23	<b>putting</b> 17:10 75:13 91:13 97:7 156:2 184:3
<b>previous</b> 148:21	<b>processes</b> 9:20 15:10 16:7 31:20 40:18 218:20,23	<b>protocol</b> 65:21	<hr/> <b>Q</b> <hr/>
<b>previously</b> 26:15 52:24 96:3 109:9, 25 138:13 142:3	<b>produce</b> 15:10 66:21 182:8	<b>proven</b> 107:5	<b>quantitative</b> 144:15
<b>primarily</b> 59:23 210:24 212:16	<b>produced</b> 147:10 181:8 182:1	<b>provide</b> 14:17 161:20	<b>quantity</b> 54:21
<b>primary</b> 12:5 202:10	<b>produces</b> 181:22 182:18	<b>provided</b> 194:1	<b>question</b> 25:3 26:9 62:1,6 68:3,22 69:4,15 75:12,14 86:10 93:18 101:16 103:1,13 105:20 130:2 136:8 145:13 147:22 158:6 168:8 171:20 178:8 189:11 190:25 204:21 212:23 213:7,22 225:1
<b>principal</b> 9:3	<b>producing</b> 64:5 182:9	<b>provisional</b> 193:3	
<b>principle</b> 100:7 103:2,5	<b>product</b> 7:3,8 8:12 13:5 112:19 117:3,8 120:14 125:9	<b>provisors</b> 121:13	
<b>print</b> 191:20 193:2 196:4		<b>PTO</b> 130:8	
<b>prior</b> 18:17 38:8 89:23 91:12 92:6,19 124:4,12 143:3		<b>publication</b> 52:16 78:12 106:5 107:1 133:9 223:11	
<b>priori</b> 172:5 201:10		<b>publications</b> 90:5	

<b>questioning</b> 124:13 188:4,6 190:6 191:6 206:3 219:23 <b>questions</b> 77:24 80:16 142:24 171:10 187:8 203:1 206:9 213:3 215:15,22 <b>quickly</b> 42:15 153:13 156:1 <b>quiet</b> 208:4	81:21 120:8 179:9 <b>reaches</b> 42:16 43:10 45:16 46:10 47:17 60:23 83:17 <b>reaction</b> 45:11 <b>reactive</b> 72:22 <b>read</b> 58:7 62:3 66:10 71:8 82:22 84:14 89:24 93:19 108:23,25 125:20 127:22 139:5 140:7 149:16 177:16 184:6 222:5 <b>reader</b> 103:25 107:6,12 224:13, 19 <b>reading</b> 35:5 108:16 127:17 133:5 220:20 221:15 <b>real</b> 160:18 172:7 201:1 <b>realistic</b> 118:8 <b>reason</b> 79:14,18 82:16,21 104:11 117:10 135:24 171:9 186:10 223:3 <b>reasonable</b> 185:19,25 186:12 191:3 <b>reasons</b> 103:24 217:24 220:24 <b>recall</b> 8:8 27:11 52:17 58:12 59:7 91:12 97:14,23 136:15 215:3 216:18 222:11,12 224:12 <b>recalling</b> 222:23 <b>receipt</b> 225:20 <b>recess</b> 49:5 80:5 121:21 163:9 191:12 215:19 <b>recollection</b> 27:19,21	<b>record</b> 15:4,6 28:19 31:9 49:3 50:7 58:7 73:6,9,11,12 101:21 190:3 205:24 210:5,7 225:18 <b>recorded</b> 83:24 <b>redirect</b> 215:13 <b>reduction</b> 64:3 66:17 <b>REEXAMINATION</b> 223:8 <b>refer</b> 17:21 87:23 95:23 114:12 117:7 122:19 133:14 140:20 151:20 183:24 <b>reference</b> 28:24 76:21 77:11,19 91:18 92:1,4 106:10 112:19 125:22 126:9 131:9 133:1 136:16,20, 24 143:19,23 144:4 145:6 147:8 148:21 150:7 168:5 221:13,16 222:12 <b>referenced</b> 25:9 26:1 69:5 80:12 81:2 106:8 132:15 133:13 138:24 142:19 168:7 219:6,10 <b>references</b> 27:24 76:19 89:25 100:4 176:25 <b>referencing</b> 78:8 98:4 100:15 <b>referred</b> 38:7 63:12 72:6 100:8 <b>referring</b> 11:25 28:2 71:10,22 72:1 73:1 87:5 100:23 101:19 103:8 105:7 107:4 140:12 152:7,10,13,15, 21 153:2 181:19 182:22, 24 217:20 <b>refers</b> 70:6,9 88:23 111:15	<b>reflect</b> 73:16,17 <b>reflecting</b> 72:21 <b>reflection</b> 22:7 <b>refrigeration</b> 65:17 <b>regenerated</b> 62:10,17 64:12,17 <b>regenerating</b> 65:25 <b>regeneration</b> 63:17,19 64:1,21 <b>reheat</b> 62:18 <b>rejection</b> 111:7,13 <b>relationship</b> 86:19,24 <b>relative</b> 39:24 149:15 154:10 169:18 <b>relax</b> 17:3 35:19 <b>relaxation</b> 47:22 <b>relaxations</b> 200:6 <b>release</b> 181:9,11 183:17 <b>released</b> 41:3,6 <b>relevant</b> 156:21 <b>relied</b> 194:15 204:19 <b>relies</b> 71:4 <b>rely</b> 126:25 <b>relying</b> 102:7,8 <b>remaining</b>
<b>R</b>			
<b>raise</b> 212:22 213:22 <b>range</b> 114:9 116:19,25 137:11 148:1,2 153:11 156:22 161:10 165:2 171:1 188:17 198:8 206:21 <b>ranges</b> 156:21 171:4 <b>rapidly</b> 47:20 <b>rare</b> 120:13 <b>rate</b> 42:3 86:21 95:12,14 102:6 167:23 <b>rates</b> 86:9 <b>ratio</b> 114:9,12 118:24 119:12, 15,24 120:22 121:5,7 177:22 179:3,5 <b>rationale</b> 170:24 176:14 <b>ratios</b> 177:23 178:9,24 185:22 187:7 195:25 204:22 206:13 <b>reach</b> 42:18 43:22 44:3 45:12 84:17 161:9 <b>reached</b> 43:8 44:5 46:1 47:14			

140:4 201:1 202:16	92:22 95:1	8:23 22:19 39:3 50:22	<b>review</b>
<b>remains</b>	<b>represent</b>	67:11 78:4 90:17,23 91:3	12:13 13:13 50:9,12,14
42:25 130:15	29:2 81:13 117:9 139:6	96:17 97:9 108:16	51:3 123:17 124:4
<b>remarkably</b>	196:24	110:16 127:9 128:21	136:20 143:3 177:5
50:20	<b>representation</b>	131:2 135:20 137:23	205:7 216:9 218:11
<b>remember</b>	214:11	147:9 150:10 154:22	225:19
86:1 87:14 97:15,16	<b>representative</b>	156:6 157:16 162:20	<b>reviewed</b>
140:15 222:21	96:24	169:2 170:12 171:24	12:8 13:22 50:4 53:3
<b>remind</b>	<b>representativeness</b>	172:14,21 183:8 185:22	92:2 96:8 109:14 110:3
189:18	214:20	199:20 204:15 206:14	125:22 126:9 137:24
<b>removal</b>	<b>representing</b>	212:7 214:24 222:7	205:4 210:1,19
67:24	8:17	<b>responds</b>	<b>rid</b>
<b>remove</b>	<b>represents</b>	157:6	59:5
19:11,16,22 59:3 62:8	200:5	<b>rest</b>	<b>rigidity</b>
66:17	<b>reproduce</b>	83:8 194:21	177:12
<b>removed</b>	190:11,18	<b>restored</b>	<b>ringer</b>
67:25 84:5 180:3 181:10	<b>reproducibility</b>	65:20	200:23
<b>removing</b>	160:15 171:25 172:15	<b>restriction</b>	<b>rise</b>
67:8	<b>reproducible</b>	33:25	48:10
<b>rendering</b>	160:21 172:22,24	<b>result</b>	<b>risk</b>
173:25	<b>request</b>	9:20 39:12 46:22,23	187:12
<b>reorient</b>	109:12 190:9,19	95:11 100:6 102:23	<b>rock</b>
22:23	<b>required</b>	141:11 166:17 190:16	55:3 223:17
<b>repeated</b>	66:16	195:12 198:21	<b>rod</b>
208:5	<b>requirement</b>	<b>resulting</b>	184:18
<b>repeatedly</b>	135:4	180:4,20 181:3	<b>role</b>
62:20	<b>requirements</b>	<b>results</b>	9:5 58:1 222:2
<b>repeating</b>	56:4	82:3 160:22 166:20	<b>room</b>
26:18	<b>requires</b>	168:13	15:25 44:1
<b>replace</b>	41:25	<b>reswelling</b>	<b>roughly</b>
72:12	<b>reserve</b>	66:13	164:17
<b>replaced</b>	225:18	<b>retain</b>	<b>routed</b>
10:10 74:2 141:9	<b>residues</b>	39:21	5:24
<b>report</b>	203:6	<b>retained</b>	<b>rubbing</b>
82:2 83:2,22 84:22 92:18	<b>resin</b>	14:1 187:6	63:9
94:6,7,14 99:8,17	123:4 124:2 125:3,11	<b>retardants</b>	<b>Rule</b>
116:19,25 209:16	<b>resistance</b>	56:15	225:19
210:12,19 215:1,2	173:14 174:3 176:13	<b>return</b>	<b>rules</b>
<b>reported</b>	177:13	41:21 63:2 67:13	6:5 13:9 187:10 208:9
81:18 85:3 88:11 93:13,	<b>resolution</b>	<b>returning</b>	<b>run</b>
23 95:20 116:9 166:5	24:21	84:10	98:25 172:4 194:15
<b>reporting</b>	<b>resolved</b>	<b>reveals</b>	213:14
95:7	211:6	146:14	<b>RX</b>
<b>reports</b>	<b>respect</b>	<b>reverse</b>	72:12,22 73:2,14,22 74:1
85:17 88:10,12,15,18,21		172:25	
		<b>reversibility</b>	
		15:11 19:6	

<b>S</b>	10	66:19 75:7,13,15,21,22 76:4,17,25 78:20 79:3,21 81:14 82:6 90:24 91:3,6 92:5 93:12,15 94:13,17 95:4,8,10 100:10,24 101:22 102:19 122:15 124:17	86:4 183:5 196:20 197:1
<b>safer</b> 39:14	<b>secondary</b> 64:3 200:2	<b>series</b> 160:24,25 197:25	<b>shrink</b> 185:1,11,20 206:19
<b>salt</b> 70:12 204:6	<b>seconds</b> 72:19	<b>serves</b> 102:15	<b>shrinkage</b> 185:23 206:14,16,20
<b>salts</b> 132:4	<b>section</b> 12:16 25:20 39:12 74:18 84:7 114:23 143:7 145:24 146:4 195:1 207:9	<b>service</b> 5:20	<b>shrinking</b> 66:24
<b>sample</b> 50:18,20 148:2,4 158:8,9 191:18 202:14 203:2 204:4,16 215:4	<b>sectioning</b> 195:23	<b>set</b> 108:20 129:24 161:23 170:17 171:11 172:22 173:1 207:20 208:8 209:3,12	<b>shrinks</b> 182:13 185:10,17,19 186:11
<b>samples</b> 157:21 160:3 194:4 199:21 200:25 204:19 211:5	<b>sections</b> 202:22	<b>shape</b> 54:21 63:15 199:12	<b>shut</b> 187:25
<b>satisfies</b> 186:14	<b>sees</b> 164:6,23 165:7,13	<b>sharp</b> 195:10	<b>shy</b> 144:14 150:6
<b>saturated</b> 16:6 36:19	<b>self-supporting</b> 181:11	<b>sheet</b> 112:19 117:3,8 136:6	<b>side</b> 16:18 72:9 122:7 210:18
<b>saturation</b> 45:13	<b>SEM</b> 199:24	<b>sheets</b> 104:24	<b>sideways</b> 206:23
<b>scale</b> 17:3 47:9,10 198:3,4	<b>sending</b> 6:1 28:17 205:1	<b>shield</b> 213:5	<b>siding</b> 134:9
<b>scanning</b> 213:5	<b>sense</b> 32:17 57:9 104:10,22 115:1 176:1 217:1 225:8	<b>shipped</b> 192:16	<b>sieve</b> 59:9 82:11
<b>scattering</b> 9:24	<b>sensitive</b> 201:19	<b>short</b> 80:2 107:18	<b>sievelike</b> 74:25
<b>science</b> 12:6 14:25 15:1 33:12	<b>sensitivity</b> 88:5	<b>shorthand</b> 106:12,15,17	<b>sieves</b> 59:3
<b>scientific</b> 27:6,9,14,17 90:5,9 100:7 103:2,5 131:16	<b>sentence</b> 35:5,11 57:12 153:6 216:12 218:13 220:1 221:12 222:19	<b>show</b> 12:24 84:16 107:23 128:2,16 129:8,15 161:6 167:10 199:18	<b>signal</b> 213:20
<b>scientifically</b> 31:19	<b>sentences</b> 140:4	<b>showed</b> 100:9 168:1	<b>significant</b> 185:23
<b>scientist</b> 9:3	<b>separated</b> 74:24	<b>showing</b> 162:10,11 177:16	<b>significantly</b> 159:7,11
<b>scientists</b> 10:21	<b>separately</b> 108:10	<b>shown</b> 13:10 85:17 86:25 168:17 207:15 209:18	<b>silica</b> 37:16 38:3,7,10 49:17 57:3,5,6 59:15,21,23 60:4,5,9,12,23 61:8 67:12,16 70:24 71:1 89:14 102:12 106:6,12, 15 132:7 135:21 150:15 219:10,13
<b>scope</b> 25:8,25 45:8,19 46:14 68:11 69:4 77:10,19 80:11 81:1 100:15 138:23 142:18 154:19 186:18,25 187:8 188:7, 23 189:22 191:2 207:7,	<b>sephadex</b> 22:11,12,18,19 34:13 35:16 36:6,7,9,15,18 37:1,2 38:4,18,21 39:3,8, 13,14,19,20,24 40:12 50:23 59:9 61:23,25 64:11,12,23 65:11,15	<b>shows</b>	<b>silicate</b> 203:16,18
			<b>silicates</b> 203:15
			<b>silicon</b>

106:13,18 201:5 203:13, 14,20 210:22 212:7,11	9:5,14,17,22 11:18 40:12 54:21 63:16 64:3,5,6 66:17 74:24 76:9 99:5 101:1 112:21 113:2,10 116:8 118:25 119:15,19, 21 120:1,4,11,18 121:6, 10 130:9 143:11 146:13, 14 149:17 151:7,9,11 152:2 153:7,23 154:22 155:16,22 211:6 213:10, 19	<b>snapshot</b> 72:17,19 74:8	40:2 45:7,18 46:13 48:22 49:1 53:25 54:5 55:15 68:10,21 69:3,14 70:17 71:3,23 72:24 73:5,18 74:11 75:9 76:2,22 77:9 78:7,25 79:16 80:3,9,25 81:10 82:18 83:5,14 84:12 85:10,21 87:12 88:2,19 89:9,15 90:8 91:16 92:8 93:16 94:1, 10,23 95:22 97:21 99:10 100:14 101:14 103:7 104:2 105:2,4,9,15,25 106:7 107:10,14 109:4 113:13 115:16 116:3,23 117:20 118:14 119:1,17 120:2,23 121:8,18 122:9, 17 123:19 124:8,22 125:4,14,25 126:22 127:11 128:4,17 129:9 130:12 131:5 132:14 133:12 135:12 136:12 138:3,16,22 139:9 140:2 142:6,10,14,17 143:16 144:11 145:9,21 147:5, 19 148:9,18 150:1,16 151:12,18 152:3,17,25 153:3 154:6,18 155:5,12 156:23 157:1 158:5 159:3,10 161:16 162:12 163:3 166:7,9,18 168:6, 19 169:22 171:19 172:17 173:19 176:22 177:2 178:25 180:17 182:20 183:13 184:9 185:13 186:6,17,23 187:4,14 188:2,13,20 189:2,9,21 190:5,17 191:7,24 192:10 193:9 195:3 199:17 205:19 207:6,12, 22 213:25 215:14,21,24 221:7 224:21 225:17
<b>silicon-based</b> 212:20		<b>so-called</b> 213:5	
<b>silver</b> 132:8		<b>soaked</b> 91:14	
<b>similar</b> 6:11 38:13 89:18 141:10 162:11 168:1		<b>soaking</b> 92:18	
<b>similarly</b> 141:6	<b>sized</b> 16:1	<b>soaks</b> 92:5	
<b>simple</b> 113:17 207:2,18,24	<b>sizes</b> 11:19,20,21	<b>soda</b> 57:15,23	
<b>simpler</b> 19:8	<b>skill</b> 27:5 71:25 83:13 115:2 118:5,23 147:3 176:18 177:15 219:11 220:19,21 221:15	<b>sodium</b> 201:5,7 204:2,3	
<b>simply</b> 21:9 34:12 44:5 46:3 56:9 67:17,20 75:12 79:6 84:18 129:13 134:2 149:20 167:24 168:16 184:7 185:4 188:5 190:25 199:24 217:2	<b>slide</b> 208:23	<b>sold</b> 218:2	
<b>single</b> 115:11 184:6 214:11	<b>slight</b> 202:17	<b>solely</b> 173:12 188:3	
<b>sir</b> 5:8 6:19 8:17,20 12:7 14:13 15:9 25:4,14 29:10,18 31:18 38:9 40:17 49:8 50:2 51:10 52:23 53:6 65:4 69:20 71:25 74:17 78:1,11 79:24 80:18 81:13,23 82:25 83:19 89:23 90:4, 13 91:23 96:2,8,11 99:3, 16 100:22 121:24 124:14 126:7 139:6,13 143:1 145:18,24 156:11 163:12 177:15,20 179:10 191:15 206:5 210:10 223:10	<b>slightly</b> 18:1 119:11 171:15	<b>solid</b> 16:17 17:1,2 20:7 21:17 23:3 36:23 53:13,21 54:14 73:4 132:2 177:9 196:25 198:21,24	
<b>sites</b> 40:8 72:10	<b>slough</b> 218:1	<b>solids</b> 132:3,5 173:13,22 174:2 176:11	
<b>sits</b> 61:12	<b>slow</b> 48:5 66:24 86:5	<b>soluble</b> 21:2,4,5	
<b>sitting</b> 47:1	<b>slowly</b> 42:16 43:14 47:19,20 48:18	<b>solute</b> 20:13 33:14,15,17 46:12	
<b>situation</b> 41:2 173:2	<b>small</b> 5:13 18:21 25:22 26:10 32:24 33:3 75:3 97:5 149:6,11 150:23 151:4,8 152:8,21 153:9,10,14,16, 21,22 154:4 155:3,10,11 156:3 193:18 196:13 203:11,25 204:3 211:13, 16,17,19 212:1 213:10, 19	<b>solution</b> 20:20 21:8 33:5,12 42:8 79:9 92:6 93:14,20 111:17 114:17 115:24 179:19	
<b>size</b>	<b>smaller</b> 34:8 116:11 120:16 146:14 197:10	<b>solutions</b> 179:14	<b>soot</b> 149:6 151:4 152:10,11, 13,20,22 153:8,25 154:3 211:15,19
	<b>smooth</b> 22:8 122:4,8,12 123:10 124:20	<b>solvent</b> 20:13 33:15,16 35:25 36:3,4,5 43:5 71:14	<b>sorb</b> 217:1
		<b>Song</b> 7:2,7,12,15,18,23 8:10, 15,17 12:21 13:2,4 14:6 24:11 25:7,24 26:13,19 27:8,16 28:13 29:8,19,24 30:3,6,13,18,22,25 31:16 34:25 35:7 38:6 39:17	<b>sorption</b> 80:20 83:23
			<b>sort</b> 20:3 22:6 29:15 38:11 47:23 60:17 68:1 118:6

197:8 201:3 208:22	<b>spectrum</b> 149:20 150:25 200:16	<b>squared</b> 140:14,15 143:22	<b>statements</b> 43:11 82:17,24 140:1
<b>sounds</b> 11:7	<b>speculate</b> 71:9 79:22 97:15 134:24 136:19 172:9	<b>stable</b> 193:24	<b>states</b> 53:18 54:11 55:2 65:15 66:23 70:22 71:11 75:21 78:19 82:10 100:3 104:12 111:16,22 112:5, 13 113:10 114:2 132:1 137:25 143:9 144:4,20 145:7 146:7 179:14 181:7 184:14 210:21 211:2 223:12
<b>source</b> 202:10	<b>speculating</b> 105:11	<b>stacked</b> 12:3	<b>static</b> 34:2
<b>sources</b> 202:5,6	<b>speculation</b> 24:12 70:18 71:4,24 72:25 73:19 74:12 75:10 76:3,23 77:16,25 79:1,5, 17 80:17 81:7 82:19 83:6,15 84:13 85:22 87:13 88:3,20 89:10,16 100:21 105:10,17 111:8 115:17 116:5,15 117:22 118:16 119:3,18 120:6 122:19 123:20 125:5,15 128:6,19 130:14 132:16 135:14 136:14 138:5 139:4 142:23 143:18 144:13 145:10 147:6,21 148:11,19 150:3,17 151:13,19 152:18 154:19,23 156:24 161:17 162:14 166:13,21 168:8, 20 171:7 172:19 173:20 176:23 184:10 185:14 203:8 207:24 214:1 224:22	<b>stage</b> 18:4 40:25	<b>stating</b> 145:2 206:8
<b>space</b> 34:3 104:19 182:12 199:6	<b>speed</b> 86:5	<b>stages</b> 44:19	<b>stationary</b> 74:22 75:2
<b>spaces</b> 197:17	<b>spell</b> 47:25	<b>standing</b> 23:14,19 26:7,14 69:12 78:4 81:9 139:10 177:2	<b>stay</b> 68:1 202:19
<b>span</b> 172:25	<b>spent</b> 5:16	<b>stands</b> 29:13	<b>steeply</b> 48:10
<b>speak</b> 148:10	<b>Spijkers</b> 111:8,10	<b>start</b> 15:17,23 16:19 22:21 36:23 60:14 84:15 97:7 179:12 209:14	<b>step</b> 64:3
<b>speaking</b> 208:3	<b>spike</b> 225:12	<b>started</b> 10:9 19:20,24 33:20 64:10 66:5 93:5 116:14	<b>stick</b> 132:25
<b>speaks</b> 93:17 94:2,11,24 97:22 106:1	<b>spot</b> 47:2	<b>starting</b> 63:7,20 159:16	<b>sticker</b> 30:17,20 53:1 96:4
<b>spec</b> 178:23	<b>sprinkle</b> 125:10	<b>starts</b> 16:3 17:3 22:16 42:15 82:2 86:5,21	<b>sticky</b> 61:13
<b>species</b> 39:6 51:16 218:17	<b>square</b> 15:25 137:12 138:2 139:21 140:11,12,13 143:10 144:1,3,5 146:8, 10 164:14	<b>state</b> 5:10 15:9 19:9 21:17 22:25 23:6 31:18 32:2,5 34:19 40:17 41:21 42:2 43:7,16,23 44:5 45:13 51:12 54:20 62:7 63:25 64:9,13,18 65:16,20 66:1,4,5,16 67:5,14 70:7 74:21 76:8,11 79:8 81:16,21 82:4 84:1,11 88:23 90:17 99:4,20 107:21 110:9 112:3 126:12 141:4 146:11 149:5 177:20 216:20 223:14	<b>stipulate</b> 26:14
<b>specific</b> 7:8 9:5 12:16,18 22:9 92:9 98:20 103:9 104:21 123:21 131:8 133:15 136:2 147:24 152:20 153:6 178:13 182:22 187:7 199:4	<b>stated</b> 26:16 113:1,5 133:22 145:22 213:18	<b>statement</b> 79:15 140:6 141:2,15 222:5	<b>stipulates</b> 136:17
<b>specifically</b> 9:11 71:10 95:10 106:10 108:17 133:22 135:1 136:19,23 152:21 163:22 166:24 169:11 176:11 182:19 183:2 185:18,25 186:9 188:9 223:12,16 224:2,10	<b>Storage</b> 65:10		<b>stirring</b> 17:10 46:22
<b>specification</b> 53:7 133:17 136:6 179:4 194:12,14			<b>stop</b> 16:9 35:25 40:15 173:22 189:17 208:7
<b>spectrometry</b> 200:2,3			<b>stopping</b> 225:13
<b>spectroscopy</b> 199:20,22			<b>stops</b> 42:24

<b>stored</b> 65:16 192:7	7:16 11:10 17:6,7 18:13 19:17 23:2,10 31:24 32:2,6,7,11,15,19,23 35:12,22 42:10 44:2 45:16 47:11,12 48:20 49:8,18,21 56:11 59:14, 16 60:6 61:7,13,18,21 62:10,19,22 64:19,21 72:12,13 73:2 74:1 106:19 116:8 120:12 147:25 180:3	<b>sulfuric</b> 203:7	173:12 220:13
<b>stream</b> 62:9	<b>substances</b> 44:25 53:12,20 54:14 59:4 89:19 139:18 140:23 141:6	<b>sum</b> 18:9	<b>switch</b> 99:22
<b>strength</b> 173:14 174:2,7 176:12	<b>substantially</b> 122:4,8,12 123:10,13 124:20 141:10	<b>support</b> 112:3 195:14	<b>swollen</b> 22:3 42:22,24 43:5 47:4 65:16,19
<b>stresses</b> 220:14	<b>substantive</b> 192:20,21	<b>supportable</b> 31:19	<b>sworn</b> 5:3
<b>stretch</b> 21:21 220:3	<b>substrate</b> 169:10 175:2,15 178:14 180:5,21 181:1 208:23 209:9	<b>surface</b> 9:6 10:13 11:1 15:19,23, 24 16:4,5,9,10,15 17:18, 24 18:17 19:13,16 21:25 22:1,6,11 23:3,8,13,15, 18,25 24:1,23 29:10,16 31:23 34:20 36:16 37:5, 9,20 39:7 47:11 48:19,20 49:19,20 51:16 52:12 56:9 57:10,13 60:17 72:14 73:3,23 79:10 86:11 102:15 123:10 124:20 131:19 132:20 134:12 136:5 137:14,15, 23 138:1 139:20,22 141:7 143:10,14 144:1,5, 21,22 146:7 149:14,16, 24 161:21 199:3 204:10 216:23,24,25 217:7,8,11, 23 218:3,17	<b>symbol</b> 201:4
<b>strike</b> 191:3	<b>subtract</b> 37:25 85:7	<b>surface-based</b> 23:7	<b>system</b> 17:25 18:22 19:15 42:13, 22 43:4 46:4,6,11,15,17, 21 47:4,13,15,17 48:13 71:7,9 82:5 83:17 170:6 195:21
<b>stronger</b> 70:23	<b>sufficiently</b> 26:4 77:13,22	<b>surfaces</b> 122:12 123:12,14 150:19 196:18 202:3 217:25	<b>systems</b> 11:23 18:25 21:6 40:20
<b>structure</b> 58:3 75:1,3,18 102:20 127:19 148:14 166:25 176:13 177:23 182:9,15, 17,19 183:3 197:3,9 207:20	<b>sugar</b> 17:9,11 20:4,5,14,17,18 21:1,2,4 32:23,24 33:3,5, 17,19 63:23	<b>surfactant</b> 164:4,12,23 183:23 184:2,4	<hr/> <b>T</b> <hr/>
<b>structures</b> 149:15 194:20 196:13, 14,19 198:8	<b>sugars</b> 76:6	<b>surrounded</b> 17:15,16 197:20 198:20	<b>table</b> 39:21 82:25 94:25 95:1 99:19 146:22 156:14,16, 20 157:4,5,18 160:10 161:4 163:14,18 165:5 177:16
<b>stuck</b> 40:14 196:18 199:11	<b>suggest</b> 125:2 157:13 173:2 190:24	<b>surrounding</b> 197:16	<b>tail</b> 48:10,11
<b>studied</b> 45:3 212:3	<b>suggested</b> 103:22 194:16 206:13	<b>suspended</b> 179:19	<b>tailoring</b> 144:21
<b>studies</b> 82:4	<b>suggesting</b> 123:5	<b>swell</b> 16:13 21:10 42:13 59:17 61:9,15,16 76:13 79:9 90:18 99:22 220:3	<b>tails</b> 86:23 171:17
<b>study</b> 162:19	<b>suggests</b> 124:17 145:16	<b>swelling</b> 18:4 36:3 82:10 91:7 94:18 99:4,9,13,18 100:6	<b>takes</b> 39:19 45:11 47:18 220:13
<b>studying</b> 81:14	<b>Suitable</b> 175:6		<b>taking</b> 17:9 128:13 153:20
<b>stuff</b> 18:10 43:15	<b>sulfur</b> 202:24 203:4,7		<b>talc</b> 132:7
<b>subject</b> 6:8 8:3,6 191:1			<b>talk</b> 14:23 15:15,21 16:23 20:14 32:12 108:3,9 131:13 132:24 136:1 217:5
<b>submit</b> 120:9			<b>talked</b> 14:8,10
<b>submitted</b> 6:22 50:8,10 109:12 117:11			
<b>subsequent</b> 187:21			
<b>substance</b>			

<b>talking</b> 12:17 28:8 35:18 36:11 41:15 46:18 71:7 86:12 93:11 96:22 97:1 101:2, 25 125:18 128:21 134:14,19 171:3 174:15, 16,18,21 175:12 177:8 182:3 216:14 217:20 219:8,12 <b>talks</b> 56:5 70:2 108:6,8 219:8 <b>taught</b> 122:2 124:6,9 <b>teaches</b> 124:15 220:25 221:14,25 <b>teaching</b> 124:23 222:8 <b>tearing</b> 100:24 101:4 <b>technical</b> 5:17 191:15 <b>technically</b> 13:9 <b>technique</b> 10:18 211:8 <b>techniques</b> 9:25 68:20 214:3 <b>technology</b> 14:21 <b>telephone</b> 205:22 <b>Teller</b> 10:22 <b>telling</b> 107:6,12,16 188:13 224:19 <b>tells</b> 113:17 135:1 <b>temperature</b> 45:14 55:5 57:25 <b>temperatures</b> 81:18 83:25 85:1,3 207:15 <b>tend</b> 63:4	<b>tendency</b> 166:23 <b>tens</b> 210:24 212:16 <b>tensile</b> 177:12 <b>term</b> 54:1 140:19 166:10,20 207:23 <b>terms</b> 25:1 27:13 35:15,25 38:4,18 39:10 46:12 48:18 100:15 103:10 115:20 123:16 135:15 155:24 158:15 159:6 162:9 168:2 169:12 175:6 189:8 212:6 214:5, 20,23 217:12 <b>terrible</b> 57:12 137:13 <b>test</b> 95:5 98:20,24 188:25 189:7 194:15 207:4 <b>tested</b> 192:12 <b>testified</b> 5:4 187:5 193:1 <b>testifying</b> 5:17 122:10 162:15 <b>testimony</b> 25:10 26:2 45:24 68:13 69:6 76:16 77:12,16,20 80:12 81:2,6 86:13 100:17 105:16 124:14 126:23 138:25 142:20 153:4 159:13 161:18 172:13,18 183:14 186:7, 19 187:9 188:24 189:22 190:10 206:20 207:8,9 222:24 <b>testing</b> 11:13 98:19 170:3 194:24 204:15 205:2,11 <b>tests</b> 168:23 171:21 <b>text</b> 25:22 28:2,3 87:24 88:23 89:1 111:3 144:17,20 146:7	<b>textbook</b> 68:19 100:9 <b>Texter</b> 80:20 <b>therefrom</b> 81:6 <b>thereof</b> 54:15 <b>thereon</b> 77:16,25 <b>thermal</b> 45:11 <b>thermodynamics</b> 34:21 <b>thick</b> 181:12 184:15,19,20,23 206:10,12 <b>thicker</b> 16:15 114:7 121:4 <b>thickness</b> 107:24 108:4,6,8,12,19, 20 110:11,12,20,24,25 111:18,19,22,24 112:6,8, 23 113:11,18,19,22,23, 25 114:4,6,10 115:25 117:18 118:20,24,25 119:14,21,23,25 120:20 121:6,9 126:14,18,19 127:1,6,14,15 128:3,16 129:5,8 130:8,10 178:16, 17,18,20 180:5,14,21 181:22 182:10 185:1,3,7 194:12 195:25 208:16,18 <b>thickness.'</b> 107:24 126:14 <b>thicknesses</b> 108:10 194:8 204:22 214:5,7 <b>thin</b> 208:19 <b>thing</b> 12:19 20:3 50:15 76:7 82:22 102:25 119:7 168:10 170:19 173:25 192:13 198:2 225:18 <b>things</b> 43:1,2 46:24 52:1 59:4 63:2 116:13 119:9 169:1	175:5 193:20 195:11 197:15 199:10 201:6,8, 20,22 <b>thinner</b> 184:21 186:11 <b>thought</b> 122:2 152:14,19 195:16 <b>thoughts</b> 125:21 <b>thousand</b> 90:19 91:8 93:1 99:15 137:12 140:10 <b>thousandth</b> 112:12 <b>three-dimensional</b> 137:19 <b>threshold</b> 65:1 <b>threw</b> 140:9 <b>tight</b> 34:7 <b>tighter</b> 172:25 <b>time</b> 5:13,16 9:9 10:7 35:12 47:18 61:10 74:8 75:11 77:3 86:3 87:1,3,5 105:20 129:13 185:8 187:19 190:14,23 192:16,17 193:3,5,8 204:7 215:11 <b>times</b> 90:19 91:8 93:1,7 99:14, 15 112:2 113:25 114:5, 14 144:14 150:6 158:8 172:4 178:17 200:24 214:14,18 <b>tin</b> 132:7 <b>tip</b> 73:24 <b>tipped</b> 24:25 119:12 <b>Tires</b> 9:12
--	---	---	--

<b>titanium</b> 58:21 106:23,25 132:6, 11,17 133:7,10,19 134:3, 8,25 135:10 200:21 216:16 217:20,21,22	13:14,16 <b>transmission</b> 95:3,6,12,14 102:5 104:8 167:12,23 174:4 194:14 221:2	<b>two-thirds</b> 82:1	82:23 83:4,7 84:15,18 96:14 104:16 108:11,14 111:3,11 112:1,11 113:6 114:3,13,24 116:22 119:6 124:14 127:5,8,16 129:22,24 131:10 134:23 147:23 153:1,23 156:16, 20 158:16 170:24 173:10 191:15 198:4 206:8 208:11,13,15 217:15
<b>title</b> 75:21 83:18	<b>transport</b> 102:13 222:2	<b>tying</b> 188:4	<b>understanding</b> 72:5 76:1,24 103:13 107:3 180:9,12,23,25 181:14 182:6 184:5 217:16
<b>titled</b> 65:10 70:2	<b>trap</b> 39:16 40:3 53:12,20 79:9 139:18 140:23	<b>type</b> 6:11 44:17 54:22 58:24, 25 70:10 82:6 85:24 86:1 87:14 140:21 148:1 149:13 154:15 168:7 201:23	<b>understands</b> 99:21 149:6 220:2
<b>TNF</b> 191:19 204:16 205:7	<b>trapped</b> 40:1,5	<b>typed</b> 8:8	<b>understood</b> 153:7 169:2 172:13 219:11
<b>TNF's</b> 205:4	<b>trapping</b> 141:6	<b>types</b> 70:15 200:5 218:20	<b>underwent</b> 41:16,20
<b>today</b> 8:17 9:23 10:2 12:22 124:4 147:18 190:7	<b>traps</b> 39:13 54:13	<b>typical</b> 70:8 74:4 137:21	<b>unfair</b> 159:18 172:10
<b>today's</b> 12:14	<b>travel</b> 190:14	<b>typically</b> 24:5 87:15 218:24	<b>uniformly</b> 125:19
<b>told</b> 130:8 169:17	<b>treated</b> 55:5,13 57:21 203:5 217:15,18,21 218:3 219:20 223:25 224:4,5,9	<b>U</b>	<b>units</b> 137:3
<b>toothpaste</b> 134:9	<b>treatment</b> 51:15,23 84:6 218:16,19, 25	<b>Uh-huh</b> 146:6 198:18 218:12	<b>unknown</b> 212:21
<b>top</b> 25:23 26:11 27:22 28:5, 6,21 51:8 58:13 89:4 95:21 115:20 118:17 119:10 122:25 125:3,10 137:20 181:23 182:1,11 184:4,18,20,21 206:11 220:1	<b>treatments</b> 217:7,23	<b>Uh-oh</b> 178:4	<b>unknowns</b> 170:12
<b>tope</b> 125:11	<b>tremendous</b> 146:12	<b>Ultimately</b> 114:3	<b>ups</b> 24:3
<b>topography</b> 216:24	<b>trend</b> 168:1,14,17 173:5	<b>ultra</b> 213:5	<b>upward</b> 48:7
<b>total</b> 153:18 154:13 194:24	<b>trends</b> 169:14 170:21 172:9	<b>unable</b> 24:25 117:9 187:18 204:25	<b>urethane</b> 93:20 94:3 166:25 174:23 182:4
<b>totally</b> 17:8 123:6 125:19 134:13 171:4	<b>tricks</b> 203:12 204:1	<b>unbound</b> 178:2	<b>usable</b> 225:9
<b>touch</b> 188:6	<b>true</b> 37:15 56:20 67:11 90:23 135:20	<b>uncured</b> 184:25	<b>usage</b> 82:11
<b>trace</b> 203:2	<b>turn</b> 25:16 61:12 216:7 222:17	<b>undamaged</b> 193:24	<b>utilization</b> 15:18 52:13 76:25 79:3 134:25
<b>transcript</b> 199:18 225:20,21	<b>turning</b> 65:4 81:23 96:11 156:11	<b>undergo</b> 16:12	
<b>transcripts</b>	<b>two-step</b> 129:15 184:11	<b>underlined</b> 111:3	
		<b>underlying</b> 103:1 161:18 162:13	
		<b>understand</b> 14:25 51:2 73:15 75:24	

<b>utilize</b> 10:10	207:4		<b>white</b> 196:17 197:12
<b>utilized</b> 9:18 62:16	<b>verbatim</b> 220:20	<b>W</b>	<b>wide</b> 82:11
<b>utilizes</b> 14:21 101:9	<b>verify</b> 192:24 194:8 195:24 204:11,21 212:10	<b>wait</b> 72:18	<b>widely</b> 59:8
<b>V</b>	<b>version</b> 17:20 32:14 61:11 107:4 149:18 223:4	<b>Wang</b> 136:20,23 142:5 143:3,6 145:19 148:6,15 150:10 151:10 176:25 177:4	<b>wild</b> 153:24
<b>vacuum</b> 19:12 67:23 202:12,15	<b>versions</b> 154:9 213:12 218:1 219:4,20 222:25 223:2,5	<b>wanted</b> 30:7	<b>wished</b> 225:7
<b>vague</b> 27:9,17 29:9 40:3 46:14 54:1,6 90:9 101:15 103:8 119:3,4,18 126:23 131:6 136:13 143:17 144:12 147:6,20 159:4,11 166:10,19 168:7 169:23 176:23 179:1 180:18 183:14 185:14 192:11 193:10 195:4 207:23	<b>versus</b> 14:25 31:21 95:13 97:1,2 131:19 134:14 151:1 159:22,24 160:12 161:5 164:15,16,24 165:7,18 169:9,12,16 170:13 171:12 172:23 177:18 215:5	<b>warm</b> 17:10	<b>wishes</b> 224:19
<b>values</b> 88:6 150:4 157:19 161:8 167:12,13,20	<b>VF</b> 142:15	<b>water</b> 16:24 17:1,10,11,12 18:7,10,14 19:10,22 20:15,16,17,19 21:1,3,4, 5,18,20 22:19,24 23:17, 19,22 32:25 33:3,4,5,14, 17 34:1,16 35:16,17,21 36:8,10,11,13,14,20 37:3,8,12,25 38:5,14,19 39:13,15,20,21,24,25 40:1,7,16 47:6 59:16 61:1,9 62:8 64:25 67:8, 25 71:2 75:17 76:12,19 79:9 80:19 82:5 83:3,8, 12,16 84:3,5,23 85:18 87:16,20,21 88:24 89:6 90:20 91:15 92:5,19 94:8 95:5,7,11,14 99:24 101:20 102:5,13,24 104:7 136:11,18 144:23 145:3,8 148:17 155:21, 23,25 176:20 177:6 193:19 202:13,16 220:5 221:1 222:2	<b>witness'</b> 6:14 25:9 68:12 69:5 77:11,20 80:12 81:2 100:17 105:16 126:23 142:19 153:4 172:18 183:14 186:7,18 207:8
<b>vapor</b> 34:23 35:14 36:10,13,14 38:19 42:4 62:9 75:17 94:8 95:5,12,14 99:24 101:20 102:5,13 104:8 167:11,23 174:3 194:14 220:5 221:1 222:2 225:14	<b>view</b> 63:17,19 102:11	<b>water-vapor</b> 81:17 82:3	<b>witnesses'</b> 26:1
<b>varies</b> 146:8	<b>viewpoint</b> 144:21	<b>ways</b> 9:23 70:3 98:25 213:4 214:13	<b>word</b> 16:6 29:11 35:2 47:25 54:6 76:5 105:14 126:24
<b>varieties</b> 156:9	<b>vinyl</b> 134:9	<b>week</b> 13:20	<b>wording</b> 125:6
<b>variety</b> 9:17 59:6	<b>visible</b> 192:22	<b>weight</b> 17:25 48:2,7 90:19 91:9 93:2 99:15 157:7 158:16 165:5 169:19	<b>words</b> 20:14 62:17 104:3 124:1 130:4
<b>vary</b> 54:21	<b>volatile</b> 185:2	<b>well-known</b> 72:6	<b>work</b> 5:15 7:3,8 8:11 12:17 13:5 27:4 101:9 155:24
<b>varying</b> 87:16	<b>volcanic</b> 55:3 58:14 223:16		<b>workable</b> 129:16
<b>VC</b> 144:24	<b>volume</b> 11:2,3,4 12:2 16:14 17:4 18:7,23 23:9 31:23 34:21 48:21 61:4 99:13 136:25 137:2,3,8,15,16,21 146:13,15,21,22 147:4, 16,20,23 148:3,13 149:17,22 150:10,12,13, 23 154:22		<b>worked</b> 11:5
<b>vendor</b> 113:9	<b>volume's</b> 137:17		<b>working</b> 21:15 102:19 190:24
<b>veracity</b> 79:14 82:16 189:1,7	<b>volumes</b> 147:9,13 148:1 150:19		<b>works</b> 38:4,18 95:17 99:6 101:7
			<b>woven</b> 179:20,23 181:2
			<b>wrapping</b> 192:14
			<b>written</b> 140:7

**wrong**  
108:15 109:17

**WVTR**  
98:19,24 103:19 221:23

---

**X**

---

**x-ray**  
200:3,5

---

**Y**

---

**years**  
10:1 82:12 193:7 194:2

**yellow**  
200:10

**Yesterday**  
14:6

**yielding**  
181:11

---

**Z**

---

**zeolite**  
38:3 58:14 201:14,16,20  
202:2 203:19,21 223:19

**zeolites**  
37:17 38:8,10 216:15,20

**zinc**  
132:6 135:20

## ERRATA SHEET

### DEPONENT'S CHANGES OR CORECTIONS

Deposition of: CHARLES DANIELS

Case Title: VF Outdoor, LLC v. Cocona, Inc.

Date of Deposition: December 7, 2018

I, CHARLES DANIELS, have the following changes or corrections to make to my deposition:

Page:Line	Changes or Corrections	Reasons for Changes or Corrections
11:9	Correction. Pressurize should be changed to pressurized	Correction of typographical error
13:22	Correction. Dr. Albert should be changed to Dr. Oelker	Correction of typographical error of name
14:22	Correction. Absorb should be changed to adsorb	Corrected answer reflects what deponent said and intended answer
14:23	Correction. The phrase "being prior art" should be added (omitted in original).	Corrected answer reflects what deponent said and intended answer
15:25	Correction. "In a room" should be changed to "The room in"	Corrected answer reflects what deponent said and intended answer
16:14	Correction. "happens is" should be changed to "happens in"	Corrected answer reflects what deponent said and intended answer
17:5	Correction. "its" should be changed to "it's"	Correction of typographical error
17:23	Correction. "Absorbent particle" should be changed to "adsorbent particle"	Deponent said adsorbent, not absorbent; corrected answer

		reflects what deponent said and intended answer
18:2	Correction. "Absorbed" should be changed to "adsorbed"	Deponent said adsorbed, not absorbed; corrected answer reflects what deponent said and intended answer
18:5	Correction. "Cross length" should be changed to "crosslinked"	Corrected answer reflects what deponent said and intended answer
19:2	Correction. "This is a" should be changed to "there is a"	Corrected answer reflects what deponent said and intended answer
19:8	Correction. Absorbent should be changed to adsorbent	Deponent said adsorbent, not absorbent; corrected answer reflects what deponent said and intended answer
19:15	Correction. "Absorbent system" should be changed to "adsorbent system"	Deponent said "adsorbent system," not "absorbent system"; corrected answer reflects what deponent said and intended answer
20:21	Correction. "Absorbed case" should be changed to "adsorbed case"	Deponent said "adsorbed case," not "absorbed case"; corrected answer reflects what deponent said and intended answer
20:25	Correction. "Absorbed moisture" should be changed to "adsorbed moisture"	Deponent said "adsorbed moisture," not "absorbed moisture"; corrected answer reflects what deponent said and intended answer
21:7	Correction. Compete should be changed to complete	Corrected answer reflects what deponent said and intended answer
21:20	Correction. "Such point" should be changed to "such a point"	Corrected answer reflects what deponent said and intended answer

22:8	Correction. "Wall" should be added after the word "smooth"	Corrected answer reflects what deponent said and intended answer
35:13	Correction. "Centered at" should be changed to "centered on"	Corrected answer reflects what deponent said and intended answer
37:19	Correction. Absorption should be changed to adsorption	Corrected answer reflects what deponent said and intended answer
37:20	Correction. Polymer should be changed to polar	Corrected answer reflects what deponent said and intended answer
37:25	Correction. Subtract should be changed to attract	Corrected answer reflects what deponent said and intended answer
40:15	Correction. Stop should be changed to spot	Corrected answer reflects what deponent said and intended answer
44:3	Correction. Set should be changed to said	Question posed used term said, not said
44:24	Correction. Adsorptive should be changed to adsorptive	Question posed used term adsorptive, not absorptive
45:15	Correction. Adsorptive should be changed to adsorptive	Question posed used term adsorptive, not absorptive
47:13	Correction. Absorbing should be changed to adsorbing	Question posed used term adsorbing, not absorbing
49:21	Correction. Absorbent should be changed to adsorbent	Deponent said adsorbent, not absorbent; corrected answer reflects what deponent said and intended answer
56:24	Correction. "They've better" should be changed to "there're better"	Correction of typographical error
52:1	Correction. Is should be changed to as	Corrected answer reflects what deponent said and intended answer

62:19	Correction. Absorbed should be changed to adsorbed	Deponent said adsorbed, not absorbed; corrected answer reflects what deponent said and intended answer
71:18	Correction. "Ad sorption" should be one word and changed to "adsorption"	Question posed used term adsorption as a single word
73:3	Correction. "Absorbs onto" should be changed to "adsorbs onto"	Deponent said "adsorbs onto," not "absorbs onto"; corrected answer reflects what deponent said and intended answer
84:19	Correction. "He masses" should be changed to "the masses"	Correction of typographical error
86:8-9	Correction. Absorption should be changed to adsorption in both the question posed and the answer given	Question posed used term adsorption, and deponent said adsorption, not absorption; corrected answer reflects question posed and deponent's answer
86:23	Correction. Off should be changed to of	Correction of typographical error
88:1	Correction. Absorption should be changed to adsorption	Question posed used term adsorption, not absorption
88:8	Correction. Absorption should be changed to adsorption	Deponent said adsorption, not absorption; corrected answer reflects what deponent said and intended answer
111:7	Correction. "Obvious misrejection" should be changed to "obviousness rejection"	Question posed used phrase "obviousness rejection," not "obvious misrejection"
111:12-13	Correction. "Obvious misrejection" should be changed to "obviousness rejection"	Question posed used phrase "obviousness rejection," not "obvious misrejection"
125:11	Correction. Tope should be changed to top	Correction of typographical error
139:21	Correction. Square should be changed to squared	Correction of typographical error
144:3	Correction. Square should be changed to squared	Correction of typographical error

144:5	Correction. Square should be changed to squared	Correction of typographical error
146:8	Correction. Square should be changed to squared	Correction of typographical error
146:10	Correction. Square should be changed to squared	Correction of typographical error
155:21	Correction. Absorb should be changed to adsorb	Deponent said adsorb, not absorb; corrected answer reflects what deponent said and intended answer
155:23	Correction. Absorption should be changed to adsorption	Deponent said adsorption, not absorption; corrected answer reflects what deponent said and intended answer
155:25	Correction. Absorption should be changed to adsorption	Deponent said adsorption, not absorption; corrected answer reflects what deponent said and intended answer
164:14	Correction. Square should be changed to squared	Correction of typographical error
175:13	Correction. Polyethylene should be changed to polyurethane	Corrected answer reflects what deponent said and intended answer
179:15	Correction. Protective should be changed to protected	Question posed used term protected, not protective
193:21	Correction. Of should be changed to or	Corrected answer reflects what deponent said and intended answer
217:1	Correction. "Ad sorb" should be one word and changed to "adsorb"	Question posed used term adsorb as a single word
218:2	Correction. Converse should be changed to commerce	Correction of typographical error

DEPONENT'S SIGNATURE:



CHARLES DANIELS

DATE: 1/10/19

UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE PATENT TRIAL AND APPEAL BOARD

Case No. IPR2018-00190  
Patent No: 8,945,287

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DEPOSITION OF: CHARLES A. DANIELS  
December 7, 2018

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VF OUTDOOR, LLC,  
Petitioner,

v.

COCONA, INC.,  
Patent Owner.

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**AFFIDAVIT**

I, Sarah Drown, hereby affirm under the penalties of perjury that the contents of the following Affidavit are true and correct and are based on personal knowledge and state as follows:

1. That I am a Court Reporter and Notary Public in and for the State of Ohio and the officer before whom the deposition of Charles A. Daniels was conducted on **December 7, 2018** in the above-entitled matter.
2. That pursuant to the request of counsel, I have reviewed my stenographic notes and back-up audio tapes of the above-referenced proceeding.
3. That after review of my stenographic notes and the back-up audio tapes, I wish the following corrections be noted to the record:

Page 14, line 22 "absorb," should read "adsorb."  
Page 17, line 23 "absorbent," should read "adsorbent."  
Page 19, line 8 "absorbent," should read "adsorbent."  
Page 21, line 7 "compete," should read "complete."  
Page 37, line 20 "polymer," should read "polar."  
Page 38, line 2 "that," should read "out."  
Page 44, line 3 "set" should read "said."  
Page 44, line 24 "absorptive," should read "adsorptive."  
Page 45, line 15 "adsorptive," should read "adsorptive."  
Page 49, line 21 "absorbent," should read "adsorbent."

Corrections Continued

Page 62, line 19 "absorbed," should read "adsorbed."  
Page 71, line 18 "ad" and "sorption" should read as one word "adsorption"  
Page 73 line 3 "absorbs," should read "adsorbs."  
Page 88, line 1 "absorption," should read "adsorption."  
Page 88, line 8 "absorption," should read "adsorption."  
Page 111, line 7 "obvious misrejection," should read "obviousness rejection."  
Page 111, line 12-13 "obvious misrejection" should read "obviousness rejection."

\* \* \* \*  
Affidavit

I DO SOLEMNLY AFFIRM THAT THE CONTENTS OF THE AFOREGOING  
AFFIDAVIT ARE TRUE AND CORRECT AND ARE BASED ON PERSONAL  
KNOWLEDGE.

01/02/2019  
DATE

  
\_\_\_\_\_  
Sarah Drown

CERTIFICATE OF SERVICE

Notice is hereby given that on the 2nd day of January 2019, a copy of the Affidavit of Sarah Drown was sent via email to:

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KATHLEEN E. OTT, ESQ.  
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