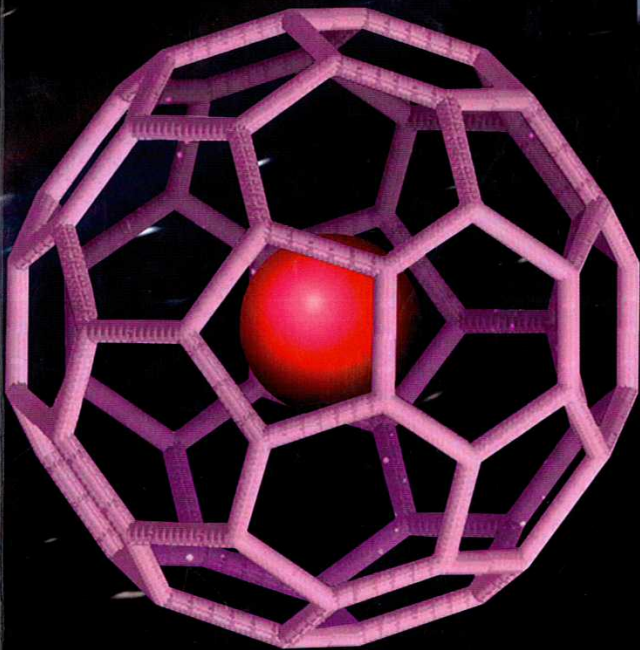


McGraw-Hill
Dictionary of
SCIENTIFIC
and
TECHNICAL
TERMS



Sixth Edition

On the cover: Representation of a fullerene molecule with a noble gas atom trapped inside. At the Permian-Triassic sedimentary boundary the noble gases helium and argon have been found trapped inside fullerenes. They exhibit isotope ratios quite similar to those found in meteorites, suggesting that a fireball meteorite or asteroid exploded when it hit the Earth, causing major changes in the environment. (Image copyright © Dr. Luann Becker. Reproduced with permission.)

Over the six editions of the Dictionary, material has been drawn from the following references: G. M. Garrity et al., *Taxonomic Outline of the Prokaryotes*, Release 2, Springer-Verlag, January 2002; D. W. Linzey, *Vertebrate Biology*, McGraw-Hill, 2001; J. A. Pechenik, *Biology of the Invertebrates*, 4th ed., McGraw-Hill, 2000; U.S. Air Force Glossary of Standardized Terms, AF Manual 11-1, vol. 1, 1972; F. Casey, ed., *Compilation of Terms in Information Sciences Technology*, Federal Council for Science and Technology, 1970; *Communications-Electronics Terminology*, AF Manual 11-1, vol. 3, 1970; P. W. Thrush, comp. and ed., *A Dictionary of Mining, Mineral, and Related Terms*, Bureau of Mines, 1968; *A DOD Glossary of Mapping, Charting and Geodetic Terms*, Department of Defense, 1967; J. M. Gilliland, *Solar-Terrestrial Physics: A Glossary of Terms and Abbreviations*, Royal Aircraft Establishment Technical Report 67158, 1967; W. H. Allen, ed., *Dictionary of Technical Terms for Aerospace Use*, National Aeronautics and Space Administration, 1965; *Glossary of Stinfo Terminology*, Office of Aerospace Research, U.S. Air Force, 1963; *Naval Dictionary of Electronic, Technical, and Imperative Terms*, Bureau of Naval Personnel, 1962; R. E. Huschke, *Glossary of Meteorology*, American Meteorological Society, 1959; *ADP Glossary*, Department of the Navy, NAVSO P-3097; *Glossary of Air Traffic Control Terms*, Federal Aviation Agency; *A Glossary of Range Terminology*, White Sands Missile Range, New Mexico, National Bureau of Standards, AD 467-424; *Nuclear Terms: A Glossary*, 2d ed., Atomic Energy Commission.

McGraw-Hill Dictionary of Scientific and Technical Terms, Sixth Edition

Copyright © 2003, 1994, 1989, 1984, 1978, 1976, 1974 by The McGraw-Hill Companies, Inc. All rights reserved. Printed in the United States of America. Except as permitted under the United States Copyright Act of 1976, no part of this publication may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of the publisher.

2 3 4 5 6 7 8 9 0 DOW/DOW 0 8 7 6 5 4 3

ISBN 0-07-042313-X

Library of Congress Cataloging-in-Publication Data

McGraw-Hill dictionary of scientific and technical terms--6th ed.

p. cm.

ISBN 0-07-042313-X (alk. paper)

1. Science--Dictionaries. 2. Technology--Dictionaries. I. Title: Dictionary of scientific and technical terms.

Q123.M15 2002
503--dc21

botallackite [MINERAL] $\text{Cu}_2(\text{OH})_3\text{Cl}\cdot 3\text{H}_2\text{O}$ A pale bluish-green to green, orthorhombic mineral consisting of a basic copper chloride; occurs as crusts of crystals. { 'bət'al-ək, līt }
botanical See crude drug. { 'bət'an-əkəl }

botanical garden [BOT] An institution for the culture of plants collected chiefly for scientific and educational purposes. { 'bət'an-əkəl 'gär-dən }

botany [BIOL] A branch of the biological sciences which embraces the study of plants and plant life. [TEXT] See merino. { 'bät-ən-ē }

bothridium [INV ZOO] A muscular holdfast organ, often with hooks, on the scolex of tetraphyllidean tapeworms. { 'bä'thrīd-ē-əm }

Bothriocephaloidea [INV ZOO] The equivalent name for the Pseudophyllidea. { 'bä'thrē-ō, səf-ə'lōid-ē-ə }

Bothriocidaroida [PALEON] An order of extinct echinoderms in the subclass Perischoechinoidea in which the ambulacra consist of two columns of plates, the interambulacra of one column, and the madreporite is placed radially. { 'bä'thrē-ō, sīk-ə'rōid-ē-ə }

bothrium [INV ZOO] A suction groove on the scolex of pseudophyllidean tapeworms. { 'bäth-rē-əm }

botryogen [MINERAL] $\text{MgFe}(\text{SO}_4)_2(\text{OH})\cdot 7\text{H}_2\text{O}$ Orange-red, monoclinic mineral consisting of a hydrated basic sulfate of magnesium and trivalent iron. { 'bä-trē-ə, jən }

botryoid [GEOL] 1. A mineral formation shaped like a bunch of grapes. 2. Specifically, such a formation of calcium carbonate occurring in a cave. Also known as clusterite. { 'bä-trē-ōid }

botryoidal [SCI TECH] Of formations and structures, shaped like a bunch of grapes. { 'bä-trē-ōid-əl }

botryomycosis [VET MED] A chronic infectious bacterial disease of horses caused by *Staphylococcus aureus* and characterized by localized fibromatous tumors. { 'bä-trē, mī'kō-səs }

Botrytis disease [PL PATH] Any of various fungus diseases of plants caused by fungi of the genus *Botrytis*; characterized by soft rotting. { 'bō'trīt-əs dī, zēz }

bottle [ENG] A container made from pipe or plate with drawn, forged, or spun end closures, and used for storing or transporting gas. { 'bäd-əl }

bottle centrifuge [ENG] A centrifuge in which the mixture to be separated is poured into small bottles or test tubes; they are then placed in a rotor assembly which is spun rapidly. { 'bäd-əl 'sen-trə, fyūj }

bottled gas [MATER] Butane, propane, or butane-propane mixtures liquefied and bottled under pressure for use as a domestic cooking or heating fuel. Also known as bugas. { 'bäd-əld 'gas }

bottle graft [BOT] A plant graft in which the scion is a detached branch and is protected from wilting by keeping the base of the branch in a bottle of water until union with the stock. { 'bäd-əl, grəft }

bottleneck [PETRO ENG] A section of reduced diameter in a drill pipe that is caused by excessive longitudinal strain or a combination of such strain and irregular swaying of the mechanism. { 'bäd-əl, nek }

bottleneck analysis [COMPUT SCI] A detailed study of the manner in which elements of a computer system are related to find out where bottlenecks arise, so that the system's performance can be improved. { 'bäd-əl, nek ə, nal-ə-səs }

bottleneck assignment problem [IND ENG] A linear programming problem in which it is required to assign machines to jobs (or vice versa) so that the efficiency of the least efficient operation is maximized. { 'bäd-əl, nek ə'sīn-mənt, prəb-ləm }

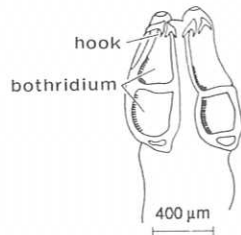
bottle test [PETRO ENG] An analytical procedure in which a chemical is added to samples of a water-oil emulsion to determine the quantity of chemical needed to separate the emulsion into oil and water fractions. { 'bäd-əl, test }

bottle thermometer [ENG] A thermoelectric thermometer used for measuring air temperature; the name is derived from the fact that the reference thermocouple is placed in an insulated bottle. { 'bäd-əl θər'mām-əd-ər }

bottom [COMPUT SCI] The termination of a file. [GEOL] 1. The bed of a body of running or still water. 2. See root. [PARTIC PHYS] The new quantum number associated with the bottom quark. Also known as beauty. { 'bäd-əm }

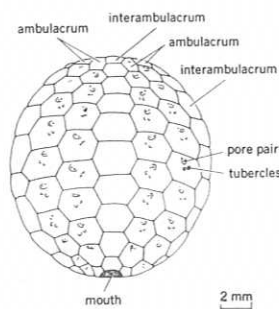
bottom blow [ENG] A type of plastics blow molding machine in which air is injected into the parison from the bottom of the mold. { 'bäd-əm, blō }

BOTHRIDIUM



A drawing of the scolex of *Acanthobothrium* species showing the hooks on the bothridium.

BOTHRIOCIDAROIDA



A reconstruction of the test of *Bothriocidaritis*.

bottom break [BOT] A branch that arises from the base of a plant stem. [MIN ENG] The break or crack that separates a block of stone from a quarry floor. { 'bäd-əm, brāk }

bottom chord [CIV ENG] Any of the bottom series of truss members parallel to the roadway of a bridge. { 'bäd-əm, 'kōrd }

bottom dead center [MECH ENG] The position of the crank of a vertical reciprocating engine, compressor, or pump when the piston is at the end of its downstroke. Abbreviated BDC. { 'bäd-əm, ded 'sen-tər }

bottom dump [ENG] A construction wagon with movable gates in the bottom to allow vertical discharge of its contents. { 'bäd-əm, dʌmp }

bottomed hole [ENG] A completed borehole, or a borehole in which drilling operations have been discontinued. { 'bäd-əmd 'hōl }

bottom fauna See benthos. { 'bäd-əm, fən-ə }

bottom fermentation [FOOD ENG] A slow alcoholic fermentation during which yeast cells accumulate at the bottom of the fermenting liquid; occurs during fermentation of lager beer and wines of low alcoholic content. { 'bäd-əm fər-mən'tā-shən }

bottom flow [ENG] A molding apparatus that forms hollow plastic articles by injecting the blowing air at the bottom of the mold. [HYD] A density current that is denser than any section of the surrounding water and that flows along the bottom of the body of water. Also known as underflow. { 'bäd-əm, flō }

bottom hold-down [PETRO ENG] A device located at the lower end of a bottom-hole pump that anchors it in a well. { 'bäd-əm 'hōl daʊn }

bottom hole [PETRO ENG] The deepest portion of an oil well. { 'bäd-əm, 'hōl }

bottom-hole assembly [PETRO ENG] That portion of the drilling assembly that extends beyond the drill pipe. { 'bäd-əm 'hōl ə, sem-blē }

bottom-hole cash [PETRO ENG] Cash which is contributed by mineral-rights lessees adjacent to a drilling lessee and which is payable when the well reaches a specified depth, regardless of whether or not the completed well is a producer. { 'bäd-əm 'hōl 'kash }

bottom-hole choke [PETRO ENG] A device containing a restricted opening that is placed in the lower end of the tubing to control fluid flow rate. { 'bäd-əm 'hōl, 'çōk }

bottom-hole packer [PETRO ENG] An anchored-in-place seal used to provide liquid-proof packing in the annular space between the outside of the oil-producing tubing and the inside of the drill casing. { 'bäd-əm 'hōl, 'pak-ər }

bottom-hole plug [PETRO ENG] A bridge plug or a cement plug installed near the bottom of the drill hole to shut off a depleted, water-producing, or unproductive zone. { 'bäd-əm 'hōl, plæg }

bottom-hole pressure [PETRO ENG] 1. Gas-drive pressure recorded at the bottom of an oil-well shaft; used to analyze oil-reservoir performance and evaluate the performance of downhole equipment. 2. The pressure in a well measured at a point opposite the producing formation. { 'bäd-əm 'hōl, 'presh-ər }

bottom-hole pressure bomb [PETRO ENG] A bomb for measuring and recording the pressure in a well at a point opposite the producing formation. { 'bäd-əm 'hōl 'presh-ər, bām }

bottom-hole pump [PETRO ENG] A pump installed near the bottom of a well to lift well fluids; may be a rod pump, high-pressure liquid pump, or a centrifugal pump. { 'bäd-əm 'hōl, pʌmp }

bottom-hole samples [PETRO ENG] Fluid samples from gas-condensate-well reservoirs; used to study the state of the hydrocarbon system under reservoir conditions and to estimate total hydrocarbons in place. { 'bäd-əm 'hōl, 'sam-pəlz }

bottom-hole separator [PETRO ENG] A device designed to separate crude oil and natural gas at the bottom of the well in order to increase the volumetric efficiency of the pumping equipment. { 'bäd-əm 'hōl 'sep-ə, rād-ər }

bottom-hole temperature [PETRO ENG] A temperature measurement made at a depth in a well equal to the midpoint of the producing zone. { 'bäd-əm 'hōl, tem-prə-çər }

bottom ice See anchor ice. { 'bäd-əm, 'īs }

bottoming drill [DES ENG] A flat-ended twist drill designed to convert a cone at the bottom of a drilled hole into a cylinder. { 'bäd-əm-īŋ, dril }

bottomland [GEOL] A lowland formed by alluvial deposit about a lake basin or a stream. { 'bäd-əm, land }