

McGRAW-HILL DICTIONARY OF SCIENTIFIC AND TECHNICAL TERMS

Sixth Edition

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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.

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capable of running on multiple platforms, for example, Java. { 'mō-bəl 'kōd }

mobile crane [MECH ENG] 1. A cable-controlled crane mounted on crawlers or rubber-tired carriers. 2. A hydraulic-powered crane with a telescoping boom mounted on truck-type carriers or as self-propelled models. { 'mō-bəl 'krān }

mobile digital computer [COMPUT SCI] Large, mobile, fixed-point operation, one-address, parallel-mode type digital computer. { 'mō-bəl 'dij·əd·əl kəm'pyū·dər }

mobile drill [MIN ENG] A drill unit mounted on wheels or crawl-type tracks to facilitate moving. { 'mō-bəl 'dril }

mobile earth station [COMMUN] An earth station intended to be used while in motion or at halts at unspecified points. { 'mō-bəl 'ərth ,stā·shən }

mobile earth terminal [COMMUN] An antenna small enough to fit in a briefcase or suitcase, used for satellite communications, especially by news-service reporters at locations that cannot be accessed by conventional transportable satellite news-gathering terminals. Abbreviated MET. { 'mō-bəl 'ərth ,tər·mən·əl }

mobile electron [PHYS CHEM] An electron that can move readily from one atom to another within a chemical structure in response to changes in the external chemical environment. { 'mō-bəl ə'lek·trən }

mobile filling [MIN ENG] Filling which is supplemented only from above, and which sinks, filling the mined-out rooms. { 'mō-bəl 'fil·iŋ }

mobile hoist [MECH ENG] A platform hoist mounted on a pair of pneumatic-tired road wheels, so it can be towed from one site to another. { 'mō-bəl 'hōist }

mobile loader [MECH ENG] A self-propelling power machine for loading coal, mineral, or dirt. { 'mō-bəl 'lōd·ər }

mobile mount [ORD] Any weapons mount which is mobile, as contrasted to one which is fixed; as a mount for mobile artillery. { 'mō-bəl 'maʊnt }

mobile phase [ANALY CHEM] 1. In liquid chromatography, the phase that is moving in the bed, including the fraction of the sample held by this phase. 2. The carrier gas in a gas chromatography procedure. { 'mō-bəl 'fāz }

mobile radio [COMMUN] Radio communication in which the transmitter is installed in a vessel, vehicle, or airplane and can be operated while in motion. { 'mō-bəl 'rād·ē·ō }

mobile-relay station [COMMUN] Base station in which the base receiver automatically tunes on the base station transmitter and which retransmits all signals received by the base station receiver; used to extend the range of mobile units, and requires two frequencies for operation. { 'mō-bəl 'rē,lā ,stā·shən }

mobile robot [CONT SYS] A robot mounted on a movable platform that transports it to the area where it carries out tasks. { 'mō-bəl 'rō,bāt }

mobile service [COMMUN] A radiocommunication service between mobile and land stations or between mobile stations. { 'mō-bəl 'sər·vəs }

mobile station [COMMUN] 1. Station in the mobile service intended to be used while in motion or during halts at unspecified points. 2. One or more transmitters that are capable of transmission while in motion. { 'mō-bəl 'stā·shən }

mobile satellite service [COMMUN] A radiocommunication service between mobile earth stations by means of one or more space stations. Abbreviated MSS. { 'mō-bəl 'səd·əl,īt ,sər·vəs }

mobile systems equipment [COMPUT SCI] Computers located on planes, ships, or vans. { 'mō-bəl 'sis·təmz ,i,kwip·mənt }

Mobilina [INV ZOO] A suborder of ciliophoran protozoans in the order Peritrichida. { 'mō-bə'li·nə }

mobility [ENG] The ability of an analytical balance to react to small load changes; affected by friction and degree of looseness in the balance components. [FL MECH] The reciprocal of the plastic viscosity of a Bingham plastic. [PHYS] Freedom of particles to move, either in random motion or under the influence of fields or forces. [SOLID STATE] See drift mobility. { 'mō'bil·əd·ē }

mobility coefficient [PHYS CHEM] The average speed of motion of molecules in a solution in the direction of the concentration gradient, at unit concentration and unit osmotic pressure gradient. { 'mō'bil·əd·ē ,kō·ə,fish·ənt }

mobility ratio [PETRO ENG] The ratio of the mobility of the

driving fluid (such as water) to that of the driven fluid (such as gas) in a petroleum reservoir. { 'mō'bil·əd·ē ,rā·shō }

mobility tensor [PL PHYS] A second-rank tensor whose product with the electric field vector for a plane wave in a plasma gives a vector equal to the average velocity of electrons or ions; components of both vectors are in phasor notation. { 'mō'bil·əd·ē ,ten·sər }

mobility threshold [ENG] On an analytical balance, the smallest load change that will cause a noticeable change in the weight measurement. { 'mō'bil·əd·ē ,θresh·hōld }

mobilization [GEOL] Any process by which solid rock becomes sufficiently soft and plastic to permit it to flow or to permit geochemical migration of the mobile components. { 'mō-bə'lā'zā·shən }

Möbius band [MATH] The nonorientable surface obtained from a rectangular strip by twisting it once and then gluing the two ends. Also known as Möbius strip. { 'mər·bē·əs ,band }

Möbius function [MATH] The function μ of the positive integers where $\mu(1) = 1$, $\mu(n) = (-1)^r$ if n factors into r distinct primes, and $\mu(n) = 0$ otherwise; also, $\mu(n)$ is the sum of the primitive n th roots of unity. { 'mər·bē·əs ,fəŋk·shən }

Möbius resistor [ELEC] A nonreactive resistor made by placing strips of aluminum or other metallic tape on opposite sides of a length of dielectric ribbon, twisting the strip assembly half a turn, joining the ends of the metallic tape, then soldering leads to opposite surfaces of the resulting loop. { 'mər·bē·əs ri·zis·tər }

Möbius strip See Möbius band. { 'mər·bē·əs ,stri:p }

Möbius transformations [MATH] These are the most commonly used conformal mappings of the complex plane; their form is $f(z) = (az + b)/(cz + d)$ where the real numbers a , b , c , and d satisfy $ad - bc \neq 0$. Also known as linear fractional transformations. Also known as bilinear transformations; homographic transformations. { 'mər·bē·əs ,tranz·fər'mā·shənz }

Mobulidae [VERT ZOO] The devil rays, a family of batoids that are surface feeders and live mostly on plankton. { 'mōbyū'lē·ə,dē }

mocaya oil [MATER] Oil from kernels of the Paraguayan palm (*Acrocomia sclerocarpa*), found in South America and the West Indies; used in manufacture of tinsplate, soaps, candles, and margarine. { 'mō'ki·yə ,oil }

mock fog [METEOROL] A simulation of true fog by atmospheric refraction. { 'māk ,fäg }

mock lead See sphalerite. { 'māk 'led }

mock moon See paraselene. { 'māk 'mūn }

mock ore See sphalerite. { 'māk 'or }

mock silver [MET] 1. An aluminum alloy containing 5% copper and 10% tin, or 5% copper and 5% silver. 2. A white brass containing 55% zinc and 45% copper. { 'māk 'sil·vər }

mock sun See parheliion; parhelion. { 'māk 'sən }

mock sun ring See parhelic circle. { 'māk 'sən ,rɪŋ }

mockup [ENG] A model, often full-sized, of a piece of equipment, or installation, so devised as to expose its parts for study, training, or testing. { 'māk ,əp }

MOCVD See metal-organic chemical vapor deposition.

modacrylic [TEXT] Of a synthetic fiber, composed of less than 85% and more than 35% by weight of acrylonitrile units. { 'mōd·ə'kril·ik }

modal class [STAT] The class that contains more individuals than any other class in a statistical distribution. { 'mōd·əl ,klas }

modal distortion See modal noise. { 'mōd·əl di'stór·shən }

modal noise [COMMUN] Interference of a multimode optical communications fiber with a laser light source when a speckle pattern in the light intensity in the fiber alters because of motion of the fiber or changes in the laser spectrum. Also known as modal distortion. { 'mōd·əl 'nōiz }

modal number [GEN] 1. The typical chromosome number of a taxonomic group. 2. The most common chromosome number of a tumor cell population. { 'mōd·əl ,nəm·bər }

mode [COMMUN] Form of the information in a communication such as literal language, digital data, and video. [COMPUT SCI] One of several alternative conditions or methods of operation of a device. [ELECTROMAG] A form of propagation of guided waves that is characterized by a particular field pattern in a plane transverse to the direction of propagation. Also

known as transmission mode. [PETR] The mineral composition of a rock, usually expressed as percentages of total weight or volume. [PHYS] A state of an oscillating system that corresponds to a particular field pattern and one of the possible resonant frequencies of the system. [STAT] The most frequently occurring member of a set of numbers. { 'mɒd }

mode converter See mode transducer. { 'mɒd kən,vərd-ər }

mode eddies [OCEANOGR] Densely packed, irregularly oval high- and low-pressure centers roughly 240 miles (400 kilometers) in diameter in which current intensities are typically tenfold greater than the local means. Also known as mesoscale eddies. { 'mɒd ,ed-ēz }

mode filter [ELECTROMAG] A waveguide filter designed to separate waves of the same frequency but of different transmission modes. { 'mɒd ,fil-tər }

mode jump [ELECTR] Change in mode of magnetron operation from one pulse to the next; each mode represents a different frequency and power level. { 'mɒd ,jəmp }

model [COMPUT SCI] See macroskeleton. [SCI TECH] A mathematical or physical system, obeying certain specified conditions, whose behavior is used to understand a physical, biological, or social system to which it is analogous in some way. { 'mɒd-əl }

model atmosphere [METEOROL] Any theoretical representation of the atmosphere, particularly of vertical temperature distribution. { 'mɒd-əl 'at-mə,sfɪr }

model-based expert system [COMPUT SCI] An expert system that is based on knowledge of the structure and function of the object for which the system is designed. { 'mɒd-əl ,bæst 'ek-spərt ,sis-təm }

model basin [ENG] A large basin or tank of water where scale models of ships can be tested. Also known as model tank; towing tank. { 'mɒd-əl 'bæs-ən }

model-following problem [CONT SYS] The problem of determining a control that causes the response of a given system to be as close as possible to the response of a model system, given the same input. { 'mɒd-əl 'fɒl-ə-wɪŋ ,prɒb-ləm }

mode-locked laser [OPTICS] A laser designed so that several modes of oscillation with closely spaced wavelengths, in which the laser would normally oscillate, are synchronized so that a pulse of light, lasting for as little as a picosecond, is generated. { 'mɒd ,lækt 'lā-zər }

model reduction [CONT SYS] The process of discarding certain modes of motion while retaining others in the model used by an active control system, in order that the control system can compute control commands with sufficient rapidity. { 'mɒd-əl rɪ'dʌk-shən }

model reference system [CONT SYS] An ideal system whose response is agreed to be optimum; computer simulation in which both the model system and the actual system are subjected to the same stimulus is carried out, and parameters of the actual system are adjusted to minimize the difference in the outputs of the model and the actual system. { 'mɒd-əl 'ref-rəns ,sis-təm }

model symbol [COMPUT SCI] The standard usage of geometrical figures, such as squares, circles, or triangles, to help illustrate the various working parts of a model: each symbol must, nevertheless, be footnoted for complete clarification. { 'mɒd-əl ,sɪm-bəl }

model tank See model basin. { 'mɒd-əl ,tæŋk }

model theory [MATH] The general qualitative study of the structure of a mathematical theory. { 'mɒd-əl ,θɪ-ə-rē }

modem [ELECTR] A combination modulator and demodulator at each end of a telephone line to convert binary digital information to audio tone signals suitable for transmission over the line, and vice versa. Also known as dataset. Derived from modulator-demodulator. { 'mɒd ,dem }

modem eliminator [COMPUT SCI] A device that is used to connect two computers in proximity and that mimics the action of two modems and a telephone line. { 'mɒd ,dem ə'lim-ə-nəd-ər }

mode number [ELECTR] 1. The number of complete cycles during which an electron of average speed is in the drift space of a reflex klystron. 2. The number of radians of phase in the microwave field of a magnetron divided by 2π as one goes once around the anode. { 'mɒd ,nəm-bər }

mode of oscillation See mode of vibration. { 'mɒd əv ,ɔs-ə'leɪ-shən }

mode of vibration [MECH] A characteristic manner in which

a system which does not dissipate energy and whose motions are restricted by boundary conditions can oscillate, having a characteristic pattern of motion and one of a discrete set of frequencies. Also known as mode of oscillation. { 'mɒd əv vɪ'brə-shən }

moder [GEOL] Humus consisting of plant material that is undergoing alteration from the living to the decayed state and is intermediate in acidity between mor and mull. { 'mɒd-ər }

moderate breeze [METEOROL] In the Beaufort wind scale, a wind whose speed is from 11 to 16 knots (13 to 18 miles per hour or 20 to 30 kilometers per hour). { 'mɒd-ə-rət 'brɛz }

moderate gale [METEOROL] In the Beaufort wind scale, a wind whose speed is from 28 to 33 knots (32 to 38 miles per hour or 52 to 61 kilometers per hour). { 'mɒd-ə-rət 'gæl }

moderator [NUCLEO] The material used in a nuclear reactor to moderate or slow down neutrons from the high velocities at which they are created in the fission process. { 'mɒd-ə ,ræd-ər }

modern algebra [MATH] The study of algebraic systems such as groups, rings, modules, and fields. { 'mɒd-əm 'al-jə-brə }

modern control [CONT SYS] A control system that takes account of the dynamics of the processes involved and the limitations on measuring them, with the aim of approaching the condition of optimal control. { 'mɒd-əm kən'trɒl }

Mode S [NAV] An augmentation of the Air Traffic Control Radar Beacon System in which each aircraft is equipped with a transponder that replies when interrogated with a discrete identity code. Also known as ADSEL (in Britain); discrete address beacon system or DABS (in the United States). { 'mɒd 'es }

mode shift [ELECTR] Change in mode of magnetron operation during a pulse. { 'mɒd ,shift }

mode skip [ELECTR] Failure of a magnetron to fire on each successive pulse. { 'mɒd ,skip }

mode switch [COMPUT SCI] A preset control which affects the normal response of various components of a mechanical desk calculator. [ELECTR] A microwave control device, often consisting of a waveguide section of special cross section, which is used to change the mode of microwave power transmission in the waveguide. { 'mɒd ,swɪtʃ }

mode transducer [ELECTR] Device for transforming an electromagnetic wave from one mode of propagation to another. Also known as mode converter; mode transformer. { 'mɒd tranz,dʒʊ-sər }

mode transformer See mode transducer. { 'mɒd tranz,fɔrm-ər }

MODFET See high-electron-mobility transistor. { 'mɒd,fet }

modification [CELL MOL] In nucleic acid metabolism, any changes made to deoxyribonucleic acid or ribonucleic acid after their original incorporation into a polynucleotide chain. [ENG] A major or minor change in the design of an item, effected in order to correct a deficiency, to facilitate production, or to improve operational effectiveness. [MET] Treatment of molten aluminum alloys containing 8–13% silicon with small amounts of a sodium fluoride or sodium chloride mixture; improves mechanical properties. [SCI TECH] Any change brought about by external or internal factors. { 'mɒd-ə-fə'keɪ-shən }

modification kit [ENG] A collection of items not all having the same basic name which are employed individually or conjunctively to alter the design of a component or equipment. { 'mɒd-ə-fə'keɪ-shən ,kit }

modified asphalt [MATER] Asphalt modified by addition of a rosin ester or synthetic resin. { 'mɒd-ə,fɪd 'as,fɒlt }

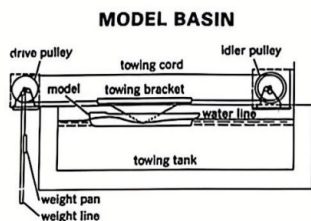
modified base [CELL MOL] A nucleotide that is an altered form of the usual four nucleic acid bases. { 'mɒd-ə,fɪd 'bæs }

modified Bessel equation [MATH] The differential equation $z^2 f''(z) + z f'(z) - (z^2 + n^2) f(z) = 0$, where z is a variable that can have real or complex values and n is a real or complex number. { 'mɒd-ə,fɪd 'bes-əl i,kwæ-zhən }

modified Bessel function of the first kind See modified Bessel function. { 'mɒd-ə,fɪd 'bes-əl ,fɒŋk-shən əv ðə 'fɜrst ,kɪnd }

modified Bessel function of the second kind See modified Hankel function. { 'mɒd-ə,fɪd 'bes-əl ,fɒŋk-shən əv ðə 'sek-ənd ,kɪnd }

modified Bessel functions [MATH] The functions defined by $I_\nu(x) = \exp(-iv\pi/2) J_\nu(ix)$, where J_ν is the Bessel function of order ν , and x is real and positive. Also known as modified



Model basin with model towed by falling weight.