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**TERMS**



Sixth Edition

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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**

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recognized by reaction with a specific antibody. { dē'ā-gō 'bləd ,grüp }

**die holder** [ENG] A plate or block on which the die block is mounted; it is fastened to the bolster or press. { 'dī ,hōld-ər }

**dieing machine** [MECH ENG] A vertical press with the slide activated by pull rods attached to the drive mechanism below the bed of the press. { 'dī-ij mə'shēn }

**die insert** [ENG] A removable part or the liner of a die body or punch. { 'dī ,in-sərt }

**diel** [SCI TECH] Occurring on a 24-hour cycle, as opposed to diurnal (day) or nocturnal (night) occurrences. { 'dī,el }

**dieldrin** [ORG CHEM]  $C_{12}H_8Cl_6O$  A white, crystalline contact insecticide obtained by oxidation of aldrin; used in moth-proofing carpets and other furnishings. { 'dēl-drən }

**dielectric** See dielectric material. { ,dī-ə'lek-trik }

**dielectric absorption** [ELEC] The persistence of electric polarization in certain dielectrics after removal of the electric field. See dielectric loss. { ,dī-ə'lek-trik əb'sɔrp-shən }

**dielectric amplifier** [ELECTR] An amplifier using a ferroelectric capacitor whose capacitance varies with applied voltage so as to give signal amplification. { ,dī-ə'lek-trik 'am-plə-fī-ər }

**dielectric antenna** [ELECTROMAG] An antenna in which a dielectric is the major component used to produce a desired radiation pattern. { ,dī-ə'lek-trik an'ten-ə }

**dielectric breakdown** [ELECTR] Breakdown which occurs in an alkali halide crystal at field strengths on the order of  $10^6$  volts per centimeter. { ,dī-ə'lek-trik 'brāk,dəun }

**dielectric circuit** [ELEC] Any electric circuit which has capacitors. { ,dī-ə'lek-trik 'sər-kət }

**dielectric constant** [ELEC] 1. For an isotropic medium, the ratio of the capacitance of a capacitor filled with a given dielectric to that of the same capacitor having only a vacuum as dielectric. 2. More generally,  $1 + \chi$ , where  $\chi$  is  $4\pi$  in Gaussian and cgs electrostatic units or 1 in rationalized mks units, and  $\chi$  is the electric susceptibility tensor. Also known as relative dielectric constant; relative permittivity; specific inductive capacity (SIC). { ,dī-ə'lek-trik 'kän-stənt }

**dielectric crystal** [ELEC] A crystal which is electrically non-conducting. { ,dī-ə'lek-trik 'krist-əl }

**dielectric curing** [ENG] A process for curing a thermosetting resin by subjecting it to a high-frequency electric charge. { ,dī-ə'lek-trik 'kyūr-ij }

**dielectric current** [ELEC] The current flowing at any instant through a surface of a dielectric that is located in a changing electric field. { ,dī-ə'lek-trik 'kər-ənt }

**dielectric displacement** See electric displacement. { ,dī-ə'lek-trik dī'splās-mənt }

**dielectric ellipsoid** [ELEC] For an anisotropic medium in which the dielectric constant is a tensor quantity  $\mathbf{K}$ , the locus of points  $\mathbf{r}$  satisfying  $\mathbf{r} \cdot \mathbf{K} \cdot \mathbf{r} = 1$ . { ,dī-ə'lek-trik ə'līp,sōid }

**dielectric fatigue** [ELECTR] The property of some dielectrics in which resistance to breakdown decreases after a voltage has been applied for a considerable time. { ,dī-ə'lek-trik fə'tēg }

**dielectric field** [ELEC] The average total electric field acting upon a molecule or group of molecules inside a dielectric. Also known as internal dielectric field. { ,dī-ə'lek-trik 'fēld }

**dielectric film** [ELEC] A film possessing dielectric properties; used as the central layer of a capacitor. { ,dī-ə'lek-trik 'film }

**dielectric flux density** See electric displacement. { ,dī-ə'lek-trik 'fləks ,den-səd-ē }

**dielectric gas** [ELEC] A gas having a high dielectric constant, such as sulfur hexafluoride. { ,dī-ə'lek-trik 'gās }

**dielectric heating** [ELEC] Heating of a nominally electrical insulating material due to its own electrical (dielectric) losses, when the material is placed in a varying electrostatic field. { ,dī-ə'lek-trik 'hēd-ij }

**dielectric hysteresis** See ferroelectric hysteresis. { ,dī-ə'lek-trik hi-stə'rē-səs }

**dielectric imperfection levels** [SOLID STATE] Energy levels that occur in the forbidden zone between the valence and conduction bands of a dielectric crystal, because of imperfections in the crystal. { ,dī-ə'lek-trik ,im-pər'fek-shən ,lev-əlz }

**dielectric leakage** [ELEC] A very small steady current that flows through a dielectric subject to a steady electric field. { ,dī-ə'lek-trik 'lek-ij }

**dielectric lens** [ELECTROMAG] A lens made of dielectric material so that it refracts radio waves in the same manner that an optical lens refracts light waves; used with microwave antennas. { ,dī-ə'lek-trik 'lenz }

**dielectric-lens antenna** [ELECTROMAG] An aperture antenna in which the beam width is determined by the dimensions of a dielectric lens through which the beam passes. { ,dī-ə'lek-trik 'lenz an'ten-ə }

**dielectric loss** [ELECTROMAG] The electric energy that is converted into heat in a dielectric subjected to a varying electric field. Also known as dielectric absorption. { ,dī-ə'lek-trik 'lɔs }

**dielectric loss angle** [ELEC] Difference between  $90^\circ$  and the dielectric phase angle. { ,dī-ə'lek-trik 'lɔs ,aŋ-gəl }

**dielectric loss factor** [ELEC] Product of the dielectric constant of a material and the tangent of its dielectric loss angle. { ,dī-ə'lek-trik 'lɔs ,fak-tər }

**dielectric matching plate** [ELECTROMAG] In waveguide technique, a dielectric plate used as an impedance transformer for matching purposes. { ,dī-ə'lek-trik 'mach-ij ,plāt }

**dielectric material** [MATER] 1. Also known as dielectric. 2. A material which is an electrical insulator or in which an electric field can be sustained with a minimum dissipation of power. 3. In a more general sense, any material other than a condensed state of a metal. { ,dī-ə'lek-trik mə'tīr-ē-əl }

**dielectric phase angle** [ELEC] Angular difference in phase between the sinusoidal alternating potential difference applied to a dielectric and the component of the resulting alternating current having the same period as the potential difference. { ,dī-ə'lek-trik 'fāz ,aŋ-gəl }

**dielectric polarization** See polarization. { ,dī-ə'lek-trik ,pō-lə-rə'zā-shən }

**dielectric power factor** [ELEC] Cosine of the dielectric phase angle (or sine of the dielectric loss angle). { ,dī-ə'lek-trik 'paʊr ,fak-tər }

**dielectric-rod antenna** [ELECTROMAG] A surface-wave antenna in which an end-fire radiation pattern is produced by propagation of a surface wave on a tapered dielectric rod. { ,dī-ə'lek-trik 'rād an'ten-ə }

**dielectric shielding** [ELEC] The reduction of an electric field in some region by interposing a dielectric substance, such as polystyrene, glass, or mica. { ,dī-ə'lek-trik 'shēld-ij }

**dielectric soak** See absorption. { ,dī-ə'lek-trik 'sɔk }

**dielectric strength** [ELEC] The maximum electrical potential gradient that a material can withstand without rupture; usually specified in volts per millimeter of thickness. Also known as electric strength. { ,dī-ə'lek-trik 'streŋkθ }

**dielectric susceptibility** See electric susceptibility. { ,dī-ə'lek-trik sə'sep-tə'bīl-əd-ē }

**dielectric test** [ELEC] A test involving application of a voltage higher than the rated value for a specified time, to determine the margin of safety against later failure of insulating materials. { ,dī-ə'lek-trik 'test }

**dielectric vapor detector** [ANALY CHEM] Apparatus to measure the change in the dielectric constant of gases or gas mixtures; used as a detector in gas chromatographs to sense changes in carrier gas. { 'dī-ə'lek-trik 'vā-pər dī'tek-tər }

**dielectric waveguide** [ELEC] A waveguide consisting of a dielectric cylinder surrounded by air. { ,dī-ə'lek-trik 'wāv,gīd }

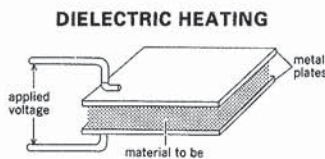
**dielectric wedge** [ELECTROMAG] A wedge-shaped piece of dielectric used in a waveguide to match its impedance to that of another waveguide. { ,dī-ə'lek-trik 'wej }

**dielectric wire** [ELECTROMAG] A dielectric waveguide used to transmit ultra-high-frequency radio waves short distances between parts of a circuit. { ,dī-ə'lek-trik 'wīr }

**dielectronic recombination** [ATOMPHYS] The combination of an electron with a positive-ion in a gas, so that the energy released is taken up by two electrons of the resulting atom. { dī-ə'lek'trən-ik ,rē,kām-bə'nā-shən }

**dielectrophoresis** [PHYS CHEM] The ability of an uncharged material to move when subjected to an electric field. { ,dī-ə'lek-trō-fə'rē-səs }

**die lines** [ENG] Lines or markings on the surface of a drawn, formed, or extruded product due to imperfections in the surface of the die. { 'dī ,līnz }



Basic assembly for dielectric heating.