

# Science and Technology

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**Chambers**

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**contact strip** (*ElecEng*) On a pantograph or bow type of current collector, the renewable metal or carbon strip that actually makes contact with the overhead wire of an electric traction system. Also *bow strip* when used on a bow collector.

**contact stud** (*ElecEng*) In the surface-contact system of electric traction, the studs in the roadway for making contact with the contact skate on an electric vehicle. The studs are only made alive when the vehicle is actually passing over them.

**contact vein** (*MinExt*) A vein occurring along the line of contact of two different rock formations, one of which may be an igneous intrusion.

**contact wire** (*ElecEng*) The overhead conductor from which current is collected, by suitable forms of collector gear, for the vehicles of some electric traction systems.

**contagion** (*Med*) The communication of disease by direct contact between persons or between an infected object and a person. Adj *contagious*.

**contagious bovine pleuro-pneumonia** (*Vet*) Lung plague. An acute, subacute or chronic disease of cattle caused by *Mycoplasma mycoides*; characterized by fever, pneumonia and pleurisy. Vaccines have been used experimentally.

**contagious catarrh** (*Vet*) See INFECTIOUS CORYZA.

**contagious distribution** (*BioSci*) See AGGREGATION.

**contagious equine abortion** (*Vet*) A contagious form of abortion in horses due to infection of the placenta by *Salmonella abortusovae*.

**contagious equine metritis** (*Vet*) Important cause of equine infertility due to a Gram-negative micro-aerophilic coccobacillus. First reported in 1977, but now rare after intense screening and prophylaxis. Abbrev *CEM*.

**contagious ophthalmia** (*Vet*) A contagious disease of sheep, characterized by conjunctivitis and keratitis, caused by a rickettsial organism *Coleiotes conjunctivae* (*Rickettsia conjunctivae*). Also *heather blindness*.

**contagious pustular dermatitis** (*Vet*) A contagious virus disease of sheep and goats characterized by vesicle and pustule formation on the skin and mucous membranes, esp on lips, nose and feet. Vaccination available. Also *malignant aphtha, orf*.

**containers** (*Eng*) (1) Reservoirs for materials, solid or fluid, which must be made of materials themselves inert to both the contents and external environment. Thermoplastics like polyolefins have replaced many traditional materials (eg glass, mild steel) for their ease of shaping, low density and chemical resistance. Some grades are, however, susceptible to ENVIRONMENTAL STRESS CRACKING. (2) Steel boxes, usually 6 or 12 m long by 2.4 m wide and 2.4 m high, used for much present-day freight and handled by special cranes, ships and road and rail vehicles.

**containment** (*NucEng*) In fusion, the use of shaped magnetic fields or of INERTIAL CONFINEMENT to contain a plasma. Also *confinement*. See MAGNETIC CONFINEMENT.

**containment time** (*NucEng*) The time for which a given temperature and pressure can be maintained in a fusion experiment.

**contaminant** (*FoodSci*) Any material or substance that is not a specified part of the food or food product. Includes: foreign bodies (term for non-food material); extraneous vegetable matter (EVM), ie vegetable stalks, leaves, seeds, etc; bones in meat and fish products; biological and microbiological contaminants, ie insects, grubs, yeasts, moulds and bacteria. See ADULTERATION, CROSS-CONTAMINATION, RESIDUES.

Geiger-Müller circuit for indicating for civil defence purposes the degree of radioactive contamination in area, esp for estimating the time for its safe occupation.

**content-addressable storage (ICT)** See ASSOCIATIVE STORAGE.

**contention (ICT)** A conflict in requests for the use of system resources, eg two programs that attempt to print on the same printer simultaneously or two users who attempt to use the same channel simultaneously in a NETWORK.

**content validity (Psych)** A subjective judgement as to whether a test is actually able to measure the variable of interest, based upon a consideration of the content of the test system.

**context-dependent memory (Psych)** The theory that information learned in a particular situation or environment is better remembered when the same conditions exist or are recreated.

**context effects (Psych)** The phenomenon whereby the context in which a stimulus is presented or a behaviour exhibited may well affect the response to the stimulus or the type of behaviour. Recreating the context may or may not be important depending upon the extent of the context effect.

**contiguity (Psych)** The closeness in time of two events which is sometimes regarded as the condition leading to association, esp in CLASSICAL CONDITIONING procedures.

**continent (Geol)** One of the Earth's major land masses including the dry land and continental shelves.

**continental climate (EnvSci)** A type of climate found in continental areas not subject to maritime influences, and characterized by more pronounced extremes between summer and winter; the winters become colder to a greater degree than the summers become hotter; also relatively small rainfall and low humidities.

**continental crust (Geol)** That part of the Earth's crust which underlies the continents and continental shelves. It is approximately 35 km thick in most regions but is thicker under mountainous areas. Sedimentary rocks predominate in its uppermost part and metamorphic rocks at depth, but the detailed composition of the lower crust is uncertain. Cf OCEANIC CRUST. See panel on EARTH.

**continental deposit (Geol)** A rock formed under subaerial conditions or in water not directly connected with the sea. See AEOLIAN DEPOSITS, GLACIAL DEPOSITS.

**continental drift (Geol)** A hypothesis put forward by Wegener in 1912 to explain the distribution of the continents and oceans and the undoubted structural, geological and physical similarities which exist between continents. The continents were believed to have been formed from one large land mass and to have drifted apart. See panel on PLATE TECTONICS.

**continental rise (Geol)** That part of the continental margin between the CONTINENTAL SLOPE and the ABYSSAL PLAIN. It is characterized by a relatively gentle slope.

**continental shelf (Geol)** The gently sloping offshore zone extending usually to about 200 m depth.

**continental slope (Geol)** The relatively steep slope between the continental shelf and the more gentle rise from the abyssal plain.

**contingency table (MathSci)** A table giving the frequencies of observations cross-classified by variate values.

**continued fraction (MathSci)** A terminating or infinite fraction of the form

background and lack the higher activity and gregarious tendencies of the GREGARIA PHASE.

**soliton (Phys)** A solitary wave; a quantum which corresponds to a solitary wave in its transmission.

**soliton propagation (ICT)** A phenomenon observed in certain non-linear systems whereby energy is propagated by solitary waves called solitons rather than by a continuous wavetrain. The effect can be used for efficient pulse transmission in OPTICAL FIBRE systems.

**solitar (Build)** A loft which is open to sunlight.

**solochrome black (Chem)** Indicator for the complexometric titration of both calcium and magnesium ions in hard water (red colour) with EDTA. Often used in parallel with MUREXIDE, which responds to calcium only. The uncomplexed indicator is blue.

**solstice (Astron)** (1) One of the two instants in the year when the Sun reaches its greatest excursion north (*summer solstice*) or south (*winter solstice*) of the equator. (2) One of the two points on the ECLIPTIC midway between the EQUINOXES.

**solubility (Chem)** The extent to which one substance will dissolve in another. Usually expressed as the mass or the quantity of a substance which will dissolve in 1 dm<sup>3</sup> of water.

**solubility curve (Chem)** The curve showing the variation of the solubility of a substance with temperature.

**solubility of polymers (Chem, Plastics)** The extent to which polymers pass into solution. Unlike small-molecule substances or materials, solubilization may be very slow owing to the time needed for large-chain molecules to diffuse into the fluid. The tendency of a polymer to be soluble in a fluid can be assessed by matching their SOLUBILITY PARAMETERS. Good solubility occurs if they match exactly, poor solubility if they differ greatly, although hydrogen bonding and degree of crystallinity can affect the outcome.

Uncrosslinked rubbers and amorphous thermoplastics tend to be soluble in organic solvents rather than water, although slight absorption can occur, esp if the polymer is hydrogen-bonded (eg nylons). Polyelectrolytes tend to behave in the opposite way. Polyolefins are usually difficult to dissolve in any solvent at ambient temperature, high temperatures (160°C) being needed.

**solubility parameter (Chem)** The square root of cohesive energy density, symbol  $\delta$ . Used to assess polymer solubility, by matching  $\delta$  (solvent) and  $\delta$  (polymer). See SOLUBILITY OF POLYMERS.

**solubility product (Chem)** The equilibrium constant defining the solubility of an ionic substance in water. It is equal, in a saturated solution, to the product of the ACTIVITIES of the ions each raised to the power of the number of ions of that type in the formula.

**soluble complex (BioSci)** Applied to antigen-antibody complexes in soluble form rather than in precipitates. Occur *in vivo* or *in vitro* when there is an excess of antigen over antibody so that a large lattice is not formed.

**soluble oil (Eng)** Cutting fluid consisting of oil and an emulsifier to which water is added.

**soluble starch (Chem)** A product of the hydrolysis of starch obtained by treating starch with dilute acids, or by boiling with glycerine, or by the action of diastase.

**soluble (Chem)** A substance which is dissolved in another.

**solubility potential (BioSci)** Same as OSMOTIC POTENTIAL.

**solvent (Chem)** Polymerization conducted in an inert solvent where components are homogeneously dissolved. Contrast with emulsion and suspension polymerizations. See CHAIN POLYMERIZATION.

**solventizer process (ChemEng)** Process for removing mercaptans from petroleum fractions by two-stage treatment with caustic soda and sodium cresylate solution.

**solvent (Chem)** The association or combination of molecules of solvent with solute ions or molecules.

**Solvay's ammonia soda process (Chem)** A process based on the fact that when a conc solution of sodium chloride is saturated with ammonia, and carbon dioxide is passed through, sodium hydrogen carbonate is precipitated and ammonium chloride remains in solution. Used for the manufacture of sodium carbonate from chloride.

**solvent (Build)** In painting a liquid capable of dissolving the BINDER and added to make it work more freely.

**solvent (Chem)** That component of a solution which is present in excess, or whose physical state is the same as that of the solution.

**solvent bonding (Textiles)** A process in which an organic liquid is used to soften fibres so that they adhere to each other and form a non-woven fabric. Cf SOLVENT WELDING.

**solvent degradation (NucEng)** The solvents used in fuel reprocessing plants have limited lifetimes because of radiation from the spent fuel.

**solvent extraction (MinExt)** In chemical extraction of values from ores or concentrates, selective transfer of desired metal salt from aqueous liquor into an immiscible organic liquid after intimate stirring together followed by phase separation.

**solvent naphtha (Chem)** Middle- and high-boiling benzene hydrocarbons chiefly consisting of toluene and xylene, obtained from the fractionation of light tar oils after the benzene fractions have been distilled off.

**solvent processing (Textiles)** Scouring, dyeing and finishing processes carried out in organic liquids rather than in aqueous solutions.

**solvent welding (Eng, Plastics)** Use of a good solvent or mixture of solvents to create a joint between similar or identical thermoplastics. Formation of a good bond may take some time, since solvent must diffuse away through the solid material before a solid joint is formed. A similar polymer is often added to the solvent to give a solvent cement to aid bond formation.

**solvolysis (Chem)** See LYOLYSIS.

**solvus (Chem)** See PHASE DIAGRAM.

**soma (BioSci)** The body of an animal, as distinct from the germ cells. Cf GERMEN. Pl *somata*. Adj *somatic*.

**somaclonal variation (BioSci)** Variability commonly found among plants that have been regenerated from TISSUE CULTURES.

**somatic (BioSci)** Of cells of the body, as distinct from the germ line.

**somatic cell (BioSci)** One of the non-reproductive cells of the parent body, as distinct from the reproductive or germ cells.

**somatic cell hybrid (BioSci)** A cell formed by the fusion of cells from the same or different species, in which there is also nuclear fusion.

ter set without space between presetting, type-matter cast on n on a larger one.

re post of a winding stair, as MEL.

hose surface is in line with the

pole of an electric machine aminations.

cket propellant in solid state, ce, form, comprising a fuel-nd oxidizer.

xtent to which one metal is utions with another.

An arrangement of atoms or ies within the same crystal SOLID SOLUTION, SUBSTITU-

ining to a circuit, device or one combination of electrical, ena within a material which is ductor. Loosely applied to all h do not rely on valves or tubes. nics) See VARACTOR.

detector of ionizing radiation sitive solid-state device. See DETECTOR.

mageTech) A video camera chip odes (pixels) to build up an l to the image light. Also solid-

See CCD ARRAY, CHARGE-FT CCD, HYPER HAD, IT CCD.

, commonly made from ruby, absolute zero to ensure low- n an intense magnetic field. A l raises electrons to a higher the lower-frequency signal, ie high-energy electrons to revert so doing, absorb photons, the ing amplified in the process.

The branch of physics which materials, including electrical semiconductors and metals, conductivity.

sch) See SOLID-STATE IMAGE

(Chem) Polymerization carried r.

welding which does not involve g, but may involve pressure.

See STRAIGHT-TYPE CABLE.

a phase diagram representing mixtures begin to melt and completely solid under equili- E DIAGRAM.