

# Chambers Science and Technology Dictionary

General Editor:  
Professor PETER M. B. WALKER, CBE, FRSE



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**armour plate** (*Eng.*). Specially heavy alloy steel plate forged in hydraulic presses, hardened on the surface; used for the protection of warships. Approximate composition: C 0.2–0.4%, Cr 1.0–3.5%, Ni 1.5–3.5% and Mo 0–0.5%.

**Armstrong oscillator** (*Telecomm.*). The original oscillator, in which tuned circuits in the anode and grid circuits of a valve are coupled.

**Arndt-Eistert reaction** (*Chem.*). Used for converting a carboxylic acid to a higher homologue. The acid chloride is added to an excess of diazomethane to form a diazoketone. The ketone undergoes catalytic rearrangement to the higher homologue or a derivative.

**aromatic compounds** (*Chem.*). Compounds related to benzene. Ring compounds containing **conjugated double bonds**.

**aromatic hydrogenation** (*Chem.*). Hydrogenation in the naphthalene series, of such nature that hydrogenation takes place only in the unsubstituted benzene ring.

**aromatic properties** (*Chem.*). The characteristic properties of aromatic compounds, e.g. reaction with concentrated nitric acid, forming nitro derivatives, reaction with concentrated sulphuric acid, forming sulphonated derivatives. The homologues of benzene differ from alkanes with regard to oxidation by readily forming benzene carboxylic acids. There are many other distinguishing characteristics between aromatic hydrocarbons and alkanes.

**arousal** (*Behav.*). A general psychophysiological concept referring to the effect of various non-specific stimulation or motivational factors on a number of physiological variables, e.g. heart rate, skin resistance. It is used to describe differences in responsiveness to general stimulation, usually along a continuum from drowsiness to alertness, for example.

**ARPA** (*Comp.*). *Advanced Research Projects Agency*. Supported by US government grant money and now renamed DARPA, *Defence Advanced Research Projects Agency*.

**ARPA Internet** (*Comp.*). A linkage of several US networks including ARPANET and MILNET. It exists to facilitate sharing resources and collaboration by participating research organisations as well as to provide a testbed for new developments in networking.

**ARPANET** (*Comp.*). A long-distance **packet switching** US network used by research interests funded by ARPA.

**array** (*Comp.*). Set of storage locations referenced by a single identifier. Individual elements of the array are referenced by combining one or more *subscripts* with the identifier, e.g. NICK(20) is an element in the array NICK, and JOS(3,5) is an element in the two-dimensional array JOS.

**array** (*Stats.*). A set of values for a particular variate.

**array** (*Telecomm.*). Used to describe an assembly of two or more individual radiating elements, appropriately spaced and energized to achieve desired directional properties. See **beam antenna**.

**array bounds** (*Comp.*). Limits on the number of items in an array.

**array dimension** (*Comp.*). Number of subscripts necessary to identify an item in an array (e.g. CLAR(26,3) has dimension 2).

**array processor** (*Comp.*). One designed to allow any machine instruction to operate on a number of data locations simultaneously.

**arrectores pilorum** (*Zool.*). In Mammals, unstriated muscles attached to the hair follicles, which cause the hair to stand on end by their contraction.

**arrested crushing** (*Min.Ext.*). Crushing so conducted that the rock falling through the machine is free to drop clear of the zone of comminution when broken smaller than the exit orifice or set.

**arrested failure** (*Elec.Eng.*). The taking of a cable off voltage, and examination before failure is complete. This is very instructive in determining the mechanism of breakdown.

**arrester** (*Elec.Eng.*). See **lightning arrester**.

**arrester gear** (*Aero.*). (1) A device on aircraft carriers and some military aerodromes, usually consisting of a number of individual transverse cables held by hydraulic shock-absorbers, which stop an aircraft when its **arrester hook** catches a cable, (2) A barrier net, usually of nylon or webbing attached to heavy drag weights, which stops fast aircraft from over-running the end of the runway in an emergency.

**arrester hook** (*Aero.*). A hook extended from an aircraft to engage the cable of an arrester gear, mainly on aircraft carriers.

**arrest points** (*Eng.*). Discontinuities on heating and cooling curves, due to absorption of heat during heating or evolution of heat during cooling, and indicating structural (phase) changes occurring in a metal or alloy.

**Arrhenius theory of dissociation** (*Chem.*). The description of aqueous solutions in terms of acids, which dissociate to give hydrogen ions, and bases, which dissociate to give hydroxyl ions. The product of the reaction of an acid and a base is a salt and water. The dissociation of these species gives their solutions the property of conducting electricity.

**arrhenotoky** (*Zool.*). Parthenogenetic production of males.

**arrhythmia** (*Med.*). Abnormal rhythm of the heart beat.

**arris** (*Build.*). The (generally) sharp exterior edge formed at the intersection of two surfaces not in the same plane (e.g. the meeting of two sides of a stone block). See also **external angle**.

**arris edge** (*Glass*). Small bevel, of width not exceeding 1/16 in (1.5 mm), at an angle of approximately 45° to the surface of the glass.

**arris fillet** (*Build.*). A small strip of wood of triangular cross-section packed beneath the lower courses of slates or tiles on a roof to throw off the water which might otherwise get under the flashing.

**arris gutter** (*Build.*). A V-shaped gutter, usually made of wood.

**arris rail** (*Build.*). A rail, with triangular cross-section, secured to posts for fences in such a manner as to show the arris in front.

**arris tile** (*Build.*). Purpose-made angular tile used to cover the intersections at hips and ridges in slated and tiled roofs. See also **bonnet tile**.

**arris-wise** (*Build.*). A term used to describe the sawing of square timber diagonally.

**arrow** (*Surv.*). Light steel wire pin, bent into ring at one end and perhaps flagged with piece of bright cloth, used to mark measured lengths in chain traversing.

**arsenic** (*Chem.*). Symbol As, at. no. 33, r.a.m. 74.9216, oxidation states 3, 5. An element which occurs free and combined in many minerals. An impurity of several commercial metals. Called grey or  $\gamma$ -arsenic to distinguish it from the other allotropic modifications. Mp 814°C (36 atm.), bp 615°C (sublimes), rel.d. 5.73 at 15°C. Used in alloys and in the manufacture of lead shot. It is important as donor impurity in germanium semiconductor devices. The arsenic of commerce, As<sub>2</sub>O<sub>3</sub>, *Arsenious oxide*, *arsenic oxide*. Obtained from the roasting of arsenical ores. It is highly poisonous, and its presence in foods and drinks is subject to severe restriction. Medical uses, once important, have much declined, but still used as a herbicide and rodenticide.

**arsenic acid** (*Chem.*). H<sub>3</sub>AsO<sub>4</sub>. Formed by the action of hot dilute nitric acid upon arsenic, or by digesting arsenic (III) oxide with nitric acid. Arsenic acid is also formed when arsenic (V) oxide is dissolved in water.

**arsenical copper** (*Eng.*). Copper containing up to about 0.6% arsenic. This element slightly increases the hardness and strength and raises the recrystallization temperature.

**arsenical pyrites** (*Min.*). See **arsenopyrite**.

**arsenic halides** (*Chem.*). Arsenic (V) fluoride, AsF<sub>5</sub>; arsenic (III) fluoride, AsF<sub>3</sub>; arsenic (III) chloride, AsCl<sub>3</sub>; arsenic (III) bromide, AsBr<sub>3</sub>; arsenic (III) iodide, AsI<sub>3</sub>.

**arsenide** (*Chem.*). Arsenic unites with most metals to form *arsenides*; e.g. iron – FeAs<sub>2</sub>. Arsenides are decomposed by water or dilute acids with the formation of the hydride **arsine**.