

CAIE Chemistry A-level

9: The Periodic Table: Chemical Periodicity Definitions

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Definitions and Concepts for CAIE Chemistry A-level

The Periodic Table: Chemical Periodicity

Amphoteric: A substance that is able to react as both an acid and a base.

Atomic radius: The radius of an atom, this is the distance from the nucleus to the outermost electrons.

Brønsted-Lowry acid: Proton donors. These species release hydrogen ions in solution.

Brønsted-Lowry base: Proton acceptors.

Covalent bond: The strong electrostatic attraction between two nuclei and the shared pair of electrons between them. Polar covalent bonds occur when there is an asymmetric electron distribution within the covalent bond due to differences in electronegativities.

Covalent substance: A substance that is made up of atoms that are covalently bonded to each other.

Electrical conductivity: A measure of the amount of electrical current a material can carry or its ability to carry the current.

Electronegativity: A measure of the ability of an atom to attract a bonding pair of electrons within a covalent bond. The Pauling scale is often used, with fluorine being the most electronegative element and caesium and francium being the least electronegative elements.

Giant atomic structure: Large structures containing lots of atoms that are covalently bonded to each other, they are usually arranged in a regular lattice. E.g. diamond.

Giant ionic lattice: A regular repeating structure made up of oppositely charged ions.

Ionic bond: Strong electrostatic attraction between two oppositely charged ions. The strength of attraction depends on the relative sizes and charges of ions.

Ionic compound: A compound made up of anions and cations which are held together by ionic bonds, which arise due to the electrostatic attraction between oppositely charged ions. These structures are neutral overall.

Ionic radius: The radius of an ion. It is the distance between the nucleus and the outermost electron of the ion.





Melting point: The melting point of a substance is the temperature at which it changes from solid state to liquid state.

Metallic bond: Strong electrostatic attraction between positive metal ions and the sea of delocalised electrons that surround them.

Oxidation number: The charge of an ion or a theoretical charge of an atom in a covalently bonded compound assuming the bond becomes ionic.

Periodicity: Trends in element properties with increasing atomic number. The trends are caused by the changes in the elements' atomic structure.

pH: A value that represents the acidity or alkalinity of a solution. Acidic solutions have a pH of less than 7 while alkali solutions have a pH of greater than 7. Neutral solutions have a pH of 7.

$$\text{pH} = -\log[\text{H}^+]$$

$$[\text{H}^+] = 10^{-\text{pH}}$$

