

N5 Glossary Unit 1

Acid

a substance behaves as an acid if it produces $H^+_{(aq)}$ ions in solution and has a pH of less than 7. The lower the pH, the more acidic the solution

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Alkaline

a substance behaves as an alkali if it produces $OH^-_{(aq)}$ ions in solution and has a pH of greater than 7. The higher the pH, the more alkaline the solution

Alkalis

a substance behaves as an alkali if it produces $OH^-_{(aq)}$ ions in solution and has a pH of greater than 7. The higher the pH, the more alkaline the solution

Aqueous solution

a solution in which a solid has been dissolved in water

Aqueous solutions

a solution in which a solid has been dissolved in water

ate

compounds contain three elements, one of which is oxygen

Atomic number

the number of protons in an atom

Balanced

a formulae equation where the number of atoms for each element reaction is the same for both the reactants and the products

Base

a substance which neutralises an acid, forming a salt and water. Bases may be soluble or insoluble in water and can be further divided into three groups; metal oxides, metal hydroxides and metal carbonates

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Boiling point

the temperature at which a substance changes from a liquid into a gas

Catalyst

a substance which speeds up chemical reactions but can be recovered chemically unchanged at the end of the reaction

Chemical reaction

a process in which reactants are converted into products, forming a new substance

Combustion

an exothermic reaction where a substance reacts with oxygen to produce energy, often referred to as burning

Compound

a substance made up of two or more elements chemically joined together

Concentrated

a large amount of solute dissolved in a small volume of solvent

Concentration

a measure of moles per litre of solution (mol l^{-1})

Concordant

titre volumes which are within $\pm 0.2 \text{ cm}^3$ of each other. The mean or average value of the concordant titres is used in calculations to determine concentration of an unknown solution

Covalent bonding

a covalent bond forms between non-metals when two positive nuclei are held together by their common attraction for a shared pair of electrons

Covalent molecular

a small compound formed between non metals which have strong covalent bonds within the molecules and only weak attractions between the molecules

Covalent network

have a network of strong covalent bonds within one giant structure and very high melting and boiling points because the network of strong covalent bonds is not easily broken

Diatomic

molecules made up of two atoms

Diatomic elements

there are seven elements which exist as diatomic molecules through the formation of covalent bonds: H_2 , N_2 , O_2 , F_2 , Cl_2 , Br_2 , I_2

Dilute

a small amount of solute dissolved in a large volume of solvent

Discrete molecule

small covalent molecules with low melting and boiling points as only weak forces of attraction between the molecules are broken when a substance changes state

Double covalent bond

two positive nuclei are held together by their common attraction for two shared pairs of electrons

Electrolytes

solutions which can conduct because the charged particles (ions) are free to move and can carry an electric current

Electron

a subatomic particle found orbiting the nucleus of an atom. Electrons have a charge of $1-$ and negligible mass

Electrostatic attraction

the attraction between positive and negative charges

Element

a substance which contains only one type of atom

End point

the point where the rate of change in a reaction is zero. On a line graph, this is the point when the line becomes horizontal

Equilibrium

the concentration of $H^+_{(aq)}$ ions and $OH^-_{(aq)}$ ions remains constant even although the formation and combination of ions continues. Represented by the symbol $\rightleftharpoons$ (reversible arrow)

Evaporation

a practical technique for separating a solvent from a solution. The solution is either left to evaporate in an evaporating dish or it can be heated so the process happens faster

Filtration

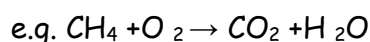
a practical technique used to separate an insoluble solid from a solid / liquid mixture

Formula

the chemical formula of a covalent molecular substance gives the number of atoms present in the molecule whereas the formula of a covalent network or ionic compound gives the simplest ratio of atoms/ions in the substance

Formulae equation

a chemical reaction expressed using formulae



Full outer electron shell

when an atom has obtained the electron arrangement of a noble gas

Gram formula mass

the sum of the relative atomic masses of all the atoms present in the formula

Group

a column of elements in the periodic table

Group ions

ions that contain more than one type of atom

ide

compounds contain two elements; the exception to this rule are hydroxides which contain three elements

Indicator

used to show the exact point where neutralisation occurs - this is called the end point and is the exact moment when the reaction reaches pH 7. A couple of drops of indicator are added to the conical flask with the reactants and a good indicator will produce a clear and sharp colour change at the end-point

Insoluble

a substance which does not dissolve in a solvent

Ion

a particle with an imbalance in the number of positive protons and negative electrons

Ion-electron equation

an equation that shows the formation of ions through loss or gain of electrons

Ionic

a bond formed by the electrostatic attraction between positive and negative ions - the formula of an ionic compound gives the simplest ratio of atoms/ions in the substance

Ionic bond

the electrostatic attraction between positive and negative ions

Ionic equation

an equation where all of the charges on the ions are shown

Ionic formulae

give the simplest ratio of each type of ion in the substance and can show the charges on each ion, if required

Ions

formed when atoms lose or gain electrons to obtain the stable electron arrangement of a noble gas; in general, metal atoms lose electrons forming positive ions and non-metal atoms gain electrons forming negative ions

Isotopes

atoms with the same atomic number but different mass numbers, atoms with the same number of protons but different numbers of neutrons

ite

compounds contain three elements, one of which is oxygen

Lattice

the structure formed by ionic compounds consisting of oppositely charged ions - each positive ion surrounded by negative ions and each negative ion surrounded by positive ions

Mass number

the sum of the number of protons and neutrons in an atom

Melting point

the temperature at which a substance changes from a solid into a liquid

Metal carbonates

compounds which contain a metal, carbon and oxygen. Metal carbonates are ionic substances as they contain a positively charged metal ion and a negatively charged carbonate ion (CO_3^{2-}). They are a type of base as they neutralise acids forming a salt and water

Metal hydroxides

ionic substances as they contain a positively charged metal ion and a negatively charged hydroxide ion. Soluble metal oxides dissolve to form metal hydroxides (alkalis) in solution. They are a type of base as they neutralise acids forming a salt and water

Metal oxides

ionic substances as they contain a positively charged metal ion and a negatively charged oxide ion. They are a type of base as they neutralise acids forming a salt and water. Soluble metal oxides dissolve to form metal hydroxides (alkalis) in solution

Mixture

substances which have been put together but are not chemically joined

The mole

chemists use a quantity called the mole to carry out chemical calculations: one mole of a substance is equal to the gram formula mass of the substance in grams

Molten

when a solid has been heated and has changed from a solid into the liquid state

Monatomic

a substance which exists as single, unbonded atoms. The noble gases are described as monatomic

Negative ion

a particle that has more electrons than protons. Non-metals gain electrons to form negative ions

Neutral

the middle number on the scale is seven (7) and solutions with this pH are neither acidic or alkaline, they are neutral. A neutral solution has equal concentrations of $\text{H}^+_{(\text{aq})}$ and $\text{OH}^-_{(\text{aq})}$ ions

Neutralisation

a neutralisation reaction is one in which a base reacts with an acid to form water and a salt

Neutron

a subatomic particle found in the nucleus of an atom. Neutrons have a relative mass of 1 no charge

Nucleus

the positively charged central core of an atom, it contains protons and neutrons and all its mass

Nuclide notation

a representation used to show the atomic number and mass number of a particle

Ore

a naturally occurring solid material from which a metal or valuable mineral can be extracted

Outer electron diagrams

diagrams can be drawn to show how outer electrons are shared to form the covalent bond(s) in a molecule

Percentage composition

a calculation to determine how much of any particular element is present in a compound

Period

a row of elements in the periodic table

Periodic table

where chemists arrange the elements based on their atomic number and properties

The pH scale

used to measure how acidic or alkaline a solution is. It measures the concentration of hydrogen ions, $H^+_{(aq)}$ present. pH values range from below 0 (highly acidic) to above 14 (highly alkaline)

Positive ion

a particle that has more protons than electrons. Metals lose electrons to form positive ions

Prefix

part of the compound name which tells us the chemical formula eg mono, di, tri etc.

Products

the substances formed in a chemical reaction

Proton

a subatomic particle found in the nucleus of an atom. Protons have a relative mass of 1 and a charge of 1+

Rate

a measure of the rate of change of a quantity (such as volume or mass) over a period of time

Reactants

the substances that react in a chemical reaction

Relative atomic mass

average atomic mass calculated for an element using the mass and proportion isotopes present

Salt

a product of a neutralisation reaction. Salts are named from the acid and the base they have been made from

Shape

the 3D arrangement of simple covalent molecules depends on the number of bonds and the orientation of these bonds around the central atom; these molecules can be described as linear, angular, trigonal pyramidal or tetrahedral

Single covalent bond

two positive nuclei are held together by their common attraction for one shared pair of electrons

Soluble

a substance that will dissolve

Solute

the substance that is dissolved

Solution

a special mixture formed when a solute dissolves in a solvent

Solvent

the liquid that does the dissolving

Spectator ions

ions which appear unchanged on both sides of an equation, they do not take part in a reaction

Standard solution

a solution whose concentration is accurately known

Subscript

a small number that is written at the bottom right hand side of an atomic symbol to indicate how many of that type of atom are present, e.g. the '3' in AlCl_3

Superscript

a small number that is written at the top right hand side of an atomic symbol to indicate charge on an ion, e.g. the '3+' in Al^{3+}

Titration

exact neutralisation of an acid by an alkali is carried out by a technique called titration

Triple covalent bond

two positive nuclei are held together by their common attraction for three shared pairs of electrons

Valency

the combining power of an element, the number of bonds the element can make

Variables

the things that we can change during a chemical reaction, such as particle size, temperature and concentration

Word equation

a chemical reaction expressed in words rather than formulae

e.g. methane + oxygen → carbon dioxide + water