

Chemistry definitions carry a condition more often than any other subject – a state, a number, "one mole", "at constant temperature". The condition is usually the second mark, so learn the whole sentence. 化学定义的限定条件就是得分点。

States of matter and atoms

Diffusion 扩散 — the spreading out of particles from a high to a low concentration, caused by their random movement; lighter gases diffuse faster

Element / compound / mixture 元素、化合物、混合物 — a substance made of one type of atom; two or more elements chemically combined; two or more substances not chemically combined and separable by physical means

Isotope 同位素 — atoms of the same element with the same number of protons but different numbers of neutrons

Proton number / nucleon number 质子数与核子数 — the number of protons in an atom; the total number of protons and neutrons in an atom

Relative atomic mass 相对原子质量 — the average mass of the isotopes of an element compared to one twelfth of the mass of an atom of carbon-12

Mole 摩尔 — the amount of substance that contains 6.02×10^{23} particles

Bonding and structure

Ionic bond 离子键 — the strong electrostatic attraction between oppositely charged ions

Covalent bond 共价键 — a shared pair of electrons between two atoms

Metallic bond 金属键 — the attraction between positive metal ions and a sea of delocalised electrons

Giant covalent structure 巨型共价结构 — a lattice of many atoms held by strong covalent bonds, giving a very high melting point – diamond, graphite, silicon dioxide

Alloy 合金 — a mixture of a metal with other elements, harder than the pure metal because the different-sized atoms stop the layers sliding

Chemical reactions

Oxidation / reduction 氧化与还原 — gain of oxygen or loss of electrons; loss of oxygen or gain of electrons

Oxidising agent 氧化剂 — a substance that oxidises another substance and is itself reduced

Exothermic reaction 放热反应 — a reaction that transfers energy to the surroundings, so the temperature of the surroundings rises

Endothermic reaction 吸热反应 — a reaction that takes in energy from the surroundings, so the temperature of the surroundings falls

Activation energy 活化能 — the minimum energy that colliding particles must have to react

Catalyst 催化剂 — a substance that increases the rate of a reaction and is not changed by the reaction

Reversible reaction 可逆反应 — a reaction that can go forwards and backwards, shown by the $\rightleftharpoons$ sign

Equilibrium 平衡 — in a closed system, when the forward and reverse reactions happen at the same rate and the concentrations do not change

Rate of reaction 反应速率 — the change in the amount of a reactant or product per unit time

Acids, bases and salts

Acid 酸 — a substance that produces hydrogen ions in aqueous solution, giving a pH below 7

Base / alkali 碱 — a substance that neutralises an acid; an alkali is a soluble base, which produces hydroxide ions in solution

Neutralisation 中和 — the reaction of an acid with a base to form a salt and water

Salt 盐 — the compound formed when the hydrogen of an acid is replaced by a metal or an ammonium ion

Strong acid / weak acid 强酸与弱酸 — an acid completely ionised in water; an acid only partially ionised in water – strength is about ionisation, not concentration

Amphoteric oxide 两性氧化物 — an oxide that reacts with both acids and alkalis to form salts, such as aluminium oxide and zinc oxide

Electrochemistry and the periodic table

Electrolysis 电解 — the breakdown of an ionic compound, molten or in aqueous solution, by the passage of electricity

Electrolyte 电解质 — a molten or aqueous substance that conducts electricity and is broken down by it

Cathode / anode 阴极与阳极 — the negative electrode, where positive ions gain electrons; the positive electrode, where negative ions lose electrons

Group 族 — a vertical column of the periodic table; elements in it have the same number of outer-shell electrons and similar chemical properties

Period 周期 — a horizontal row of the periodic table; the number of the period is the number of occupied electron shells

Transition element 过渡元素 — a metal from the central block, with variable oxidation states, coloured compounds, and catalytic behaviour

Reactivity series 活动性顺序 — metals arranged in order of their tendency to form positive ions; a more reactive metal displaces a less reactive one from its compound

Organic chemistry and the environment

Homologous series 同系物 — a family of similar compounds with the same general formula and the same functional group, whose properties change gradually

Functional group 官能团 — the atom or group of atoms responsible for the characteristic reactions of a compound

Saturated / unsaturated 饱和与不饱和 — containing only single carbon-carbon bonds; containing at least one carbon-carbon double bond

Structural isomers 结构异构体 — compounds with the same molecular formula but different structural formulae

Addition polymerisation 加成聚合 — many small alkene molecules joining to form one long molecule, with no other product

Fractional distillation 分馏 — the separation of a mixture of liquids using the differences in their boiling points

Greenhouse gas 温室气体 — a gas that absorbs infrared radiation re-emitted by the Earth, warming the atmosphere – carbon dioxide, methane

Catalytic converter 催化转化器 — a device in an exhaust that converts carbon monoxide and nitrogen oxides into carbon dioxide and nitrogen