

AS CHEMISTRY DEFINITIONS

CHAPTER 1: ATOMS, MOLECULES AND STOICHEMISTRY

1. Relative atomic mass

- the ratio of the average mass of one atom of the element to $1/12$ the mass of a carbon-12 atom.

2. Relative isotopic mass

- the ratio of the average mass of one atom of the isotope to $1/12$ the mass of a carbon-12 atom.

3. Relative molecular mass

- the ratio of the average mass of one molecule of a substance to $1/12$ the mass of a carbon-12 atom.

4. Relative formula mass

- the ratio of the average mass of one formula unit of the compound to $1/12$ the mass of a carbon-12 atom.

5. Mole

- the amount of substance containing a number of particles equal to the Avagadro constant.

6. Empirical formula

- the simplest formula which shows the simplest ratio of the atoms of the different elements in the compound

7. Molecular formula

- shows the actual number of atoms of each element present in one molecule of a compound.

CHAPTER 2: ATOMIC STRUCTURE

1. Isotopes

- atoms of the same element with the same proton number but different nucleon number.

2. First Ionisation Energy

- the energy required to remove 1 mole of electrons from 1 mole of gaseous atoms to form 1 mole of gaseous cations.

CHAPTER 3: CHEMICAL BONDING

1. Ionic bond

-Electrostatic force of attraction between two oppositely charged ions.

2. Covalent bond

-Electrostatic force of attraction between two neighbouring nuclei have for a pair of electrons shared between them.

3. Metallic bond

- Electrostatic force of attraction between the delocalised electron cloud and the metal ions.

4. Bond length

-The distance between the nuclei of the 2 atoms joined by a covalent bond.

5. Bond energy/ Bond dissociation enthalpy

- Energy required to break 1 mole of a covalent bond between 2 atoms in its gaseous state.

6. Bond polarity

-Bonding electrons are unequally shared.

CHAPTER 4: STATES OF MATTER

Kinetic Theory of Gases

- Gas particles have negligible volume compared to volume of gas.

- Gas particles have negligible intermolecular forces.

- All collisions between the molecules are perfectly elastic.

- Particles are continuously moving in a random motion.

CHAPTER 5: CHEMICAL ENERGETICS

1. Standard enthalpy change of formation

- Enthalpy change when 1 mole of a compound is formed from its elements in their standard states under standard conditions (25°C, 1 atm).

2. Standard enthalpy change of combustion

- Enthalpy change when 1 mole of a substance is burnt in excess of oxygen under standard conditions (25°C, 1 atm).

3. Standard enthalpy change for atomization

- Enthalpy change to form 1 mole of gaseous atom from an element or molecule under standard conditions (25°C, 1 atm).

4. Standard enthalpy change for hydration

- Enthalpy change when 1 mole of the gaseous ions are dissolved in a large amount of water under standard conditions (25°C, 1 atm).

5. Standard enthalpy change for solution

- Enthalpy change when 1 mole of a substance dissolves in a large volume of solvent that addition of more solvent produces no further heat change under standard conditions (25°C, 1 atm).

6. Standard enthalpy change of neutralization

- Enthalpy change when 1 mole of water is formed from 1 mole of H^+ ion and 1 mole of OH^- ion under standard conditions (25°C, 1 atm).

7. Hess Law

- The enthalpy change for a reaction from reactants to products is constant regardless of the path taken, provided final and initial conditions are the same

CHAPTER 7: EQUILIBRIA

1. Reversible reactions

- a reaction that can proceed in both forward and backward directions.

2. Dynamic equilibrium

- rate of forward reaction equal to rate of backward reaction and equilibrium concentration of reactants and product remain constant

3. Le Chatelier Principle

- whatever is done to a system in equilibrium, the system does the opposite.

4. Degree of dissociation

- the fraction of molecules that dissociate into ions.

5. Strong acid

- A substance which ionise completely in water to produce a high concentration of H^+ ions.

6. Weak acid

- A substance which ionise partially in water to produce a low concentration of H^+ ions.

CHAPTER 8: REACTION KINETICS

1. Rate of reaction

- the change in concentration of reactants or products per unit time.

2. Activation energy

- the minimum energy required for a reaction to take place when the molecules collide.

3. Homogenous Catalysis

- both the catalyst and reactants used are in the same physical state.

4. Heterogenous catalysis

- the catalyst and reactants are in different physical state.

5. Autocatalysis

- when a product acts as a catalyst in the reaction, the catalyst is said to be an autocatalyst.

6. Catalyst

- substance that speeds up a chemical reaction by lowering activation energy.

CHAPTER 10: ORGANIC CHEMISTRY

1. Structural formula

- The minimal detail using conventional groups.

2. Functional group

- A group of atoms within a compound, whose reactions dominate the chemistry of the molecule and so, gives the characteristic properties.

3. Homolytic fission

- The breaking of a covalent bond in such that one electron goes to each of the atom, forming free- radicals.

4. Heterolytic fission

- The breaking of a covalent bond such that both the electrons go to the same atom, forming positive and negative ions.

5. Free radical

- An atom or group with an unpaired electron formed from the homolytic fission of a covalent bond and are very reactive.

6. Nucleophile

- Contains a lone pair of electron and are attracted to electron deficient sites.

7. Electrophile

- Electron- deficient species which can accept electron attracted to electron rich sites in a molecule.

8. Addition

- involves two molecules joining together to form a single new molecule. Usually involve reactions with unsaturated organic compounds.

9. Substitution

- involves replacing an atom(or group of atoms) by another atom (or group of atoms).

10. Elimination

- involves the removal of a molecule from a large molecule.

11. Hydrolysis

- involves breaking covalent bonds by reaction with water.

12. Isomerism

- Compounds have same molecular formula but different arrangement of the atom in the molecule.

13. Structural Isomerism

- same molecular formula, but different structural formula.

14. Stereoisomerism

- same structural formula but different spatial arrangement of atoms.

15. Cis- isomer

- Both hydrogen atoms are on the same side of the carbon-carbon bond.

16. Trans- isomer

- Both hydrogen atoms are on the opposite side of the carbon- carbon bond.

17. Chiral centre

- Carbon atom being surrounded by 4 different atoms or group of atoms.

18. Hydrocarbon

- An organic compound which only consists of carbon and hydrogen atoms.

19. Cracking

- break large hydrocarbons into smaller hydrocarbons.

20. Fractional distillation

- The separation of compounds by their boiling points.

21. Polyunsaturated fatty acid

- Fatty acid that contains more than one C=C double bond.

22. Enhanced greenhouse effect

- The trapping of reflected heat from the Earth in the lower atmosphere, producing global warming.