Revision Guide 3rd Form Chemistry

**STATES OF MATTER**

* Explain how evidence supports the particulate theory of matter; osmosis, diffusion and Brownian motions
* Distinguish among the three states of matter; Arrangement of particles, energy of particles, strength of forces of interaction. Consideration of physical characteristics of states.
* Explain the changes between the three states of matter in terms of energy and arrangement of particles. Consideration of freezing, melting, boiling, evaporation, sublimation, condensation; heating and cooling curves
* Know how to plot/read/interpret cooling & melting point curves

**MIXTURES AND SEPARATIONS**

* Distinguish between pure substances and mixtures; Elements, compounds, atoms, molecules, fixed composition, properties, variable composition, variable properties.
* Distinguish among solutions, suspensions and colloids;
* Types of mixtures heterogeneous and homogeneous
* Miscible and immiscible liquids
* Identify different types of solutions; Types of solutions: solid in liquid, solid in solid, gas in liquid, liquid in liquid, gas in gas.
* Apply suitable separation techniques based on differences in properties of the components of mixtures; Properties to be included: particle size, boiling point, crystalline structure, solubility and solute mobility in solvent.
* How to draw/label/use apparatus for filtration, evaporation, crystallization, simple distillation, fractional distillation, paper chromatography, solvent extraction decanting
* Describe the extraction of sucrose from sugar cane. A simple treatment of the following crushing, precipitation, filtration, vacuum distillation, crystallization, centrifugation
* How to recognize a pure substance from its melting point.

**ATOMIC STRUCTURE**

* The atom as consisting of three basic particles: protons, neutrons and electrons arranged in shells.
* State properties(charge and mass) of electrons, protons and neutrons;
* Define atomic number and mass number;
* Calculate: the mass number, atomic number, number of protons ,electrons, neutrons and electron configuration of neutral atoms , cations and anions using that fact that **mass number = atomic number + number of neutrons**
* Interpret notations of the form ; a – mass number; b – atomic number, c – charge, d - number of items in the entity, X – symbol of atom.
* Define isotopy; Isotopes as atoms with the same number of protons and different number of neutrons.
* List uses of radioactive isotopes; At least three uses of radioactive isotopes; for example, carbon dating, radiotherapy, tracers, pacemakers and energy generation.
* Know properties of α- particles, β-particles and γ- rays( penetrating power)

**PERIODIC TABLE AND PERIODICITY**

* Explain the basis for the arrangement of elements in the periodic table; Classification based on atomic number, atomic structure. Arrangement in periods and groups.
* Predict: number of electrons in valence shell, the charge of ion from, electronic configuration of atom or ion
* Position of metal and non-metals in periodic table
* Predict the position of an element in periodic table based on atomic number (number of shells & number of electrons in valence shell)

**STRUCTURE AND BONDING**

* Explain the formation of ionic and covalent bonds; Draw dot and cross diagrams to show ionic and covalent bonding for any combination of elements given
* Predict the likelihood of an atom forming an ionic or a covalent bond based on atomic structure;
* Write formulae to represent ions, molecules and formula units;
* Explain metallic bonding; Arrangement of cations and mobile electrons
* Calculate: the name, formula of ionic compounds, r.fm & r.m.m of compounds