Inorganic chemistry

1. Modern atomic theory. Elements and atomic number. Isotopes and atomic weight.

2. The Periodic Table. Symbols of elements. The periodic table and some characteristics of different groups. Electronic structure of atoms and electron configurations. Electron configurations and the periodic table.

3. Molecular compounds. Covalent bonds and the periodic table. Multiple covalent bonds and coordinate covalent bonds. Characteristics of molecular compounds. Molecular formulas and Lewis structures. Polar covalent bonds and electronegativity, polar molecules. Naming binary molecular compounds.

4. Classification and balancing of chemical reactions. Classes of chemical reactions. Chemical equations and balancing chemical equations. Acids, bases, and neutralization reactions. Redox reactions.

5. Mole and mass relationships. The mole and Avogadro's number.

6. Reaction rates and chemical equilibria. Endothermic and exothermic chemical reactions. Factors that influence chemical reaction rates.

7. Physical quantities. Metric system of units. Metric units of length, mass, volume

8. Fundamental chemical laws. Law of conservation of mass, definite proportions, multiple proportions.

9. Mole concept and chemical formulas. Calculations involving chemical equations. Calculations involving volume and concentration.

10.Acids and bases in aqueous solution, some common acids and bases, the Brønsted–Lowry definition of acids and bases, acid dissociation constants, acid and base strength.

Organic chemistry

1. Alkanes. The nature of organic molecules. The structure of organic molecules: alkanes and their isomers, Drawing organic structures. Naming alkanes, cycloalkanes.

2. Alkenes and Alkynes. Naming alkenes and alkynes. The structure of alkenes, cis–trans isomerism.

3. Aromatic compounds and the structure of benzene. Naming aromatic compounds.

4. Alcohols - some common alcohols Naming alcohols. Phenols- some common phenols.

5. Carboxylic acids and their derivatives properties and names. Some common carboxylic acids.

6. Amino acids structures. Chemical properties of proteins.

7. Enzymes and vitamins. Catalysis by enzymes. How enzymes work. Some of vitamins and minerals.