9Th class

➢ Mixtures

The study of mixtures is a fundamental topic in chemistry, covering a range of concepts such as types of mixtures, methods of separation, and properties of mixtures. Here are some key points to consider when studying the chemistry of mixtures:

❖ Types of Mixtures:

1. **Homogeneous Mixtures:**
   - Also called solutions.
   - Uniform composition throughout.
   - Examples include saltwater and air.
2. **Heterogeneous Mixtures:**
   - Non-uniform composition.
   - Components can be visibly distinguished.
   - Examples include salad dressing and granite.
3. **Colloids:**
   - Intermediate between solutions and suspensions.
   - Particles are larger than those in solutions but smaller than those in suspensions.
   - Examples include milk and fog.

❖ Methods of Separation:

1. **Filtration:**
   - Used to separate solids from liquids or gases.
   - Based on differences in particle size.
2. **Distillation:**
   - Separates components based on differences in boiling points.
   - Useful for purifying liquids.
3. **Chromatography:**
   - Separates components based on differences in solubility and/or mobility in a given solvent.
   - Various types include paper chromatography and gas chromatography.
4. **Centrifugation:**
   - Separates components based on differences in density.
   - Often used to separate solids from liquids.

5. **Magnetism:**
    - Used to separate magnetic substances from non-magnetic substances.

❖ Properties of Mixtures:

1. **Boiling Point Elevation and Freezing Point Depression:**
    - Adding solute to a solvent affects its boiling and freezing points.
    - Colligative properties depend on the number of solute particles.
2. **Concentration:**
    - Describes the amount of solute in a given amount of solvent.
    - Common units include molarity and molality.
3. **Solubility:**
    - The maximum amount of solute that can dissolve in a solvent at a given temperature.
    - Affected by temperature and pressure.
4. **Tyndall Effect:**
    - The scattering of light by colloidal particles, causing the mixture to appear cloudy or milky.
5. **Brownian Motion:**
    - The random motion of particles in a fluid (liquid or gas), caused by collisions with surrounding particles.
    - Observed in colloids.

❖ Mixtures in Daily Life:

1. **Food and Cooking:**
    - Many culinary processes involve the creation and separation of mixtures (e.g., making soup, filtering coffee).
2. **Medicine:**
    - Pharmaceutical formulations often involve mixtures of active ingredients and excipients.
3. **Environmental Applications:**
    - Water treatment involves separating impurities from water through various methods.
4. **Chemical Industry:**
    - Production processes often involve creating and manipulating mixtures.