9TH CLASS

➢ Effect of Change of Pressure

The solubility of a gas in a liquid is influenced by changes in pressure, and this relationship is described by Henry's Law. Henry's Law states that the solubility of a gas in a liquid is directly proportional to the partial pressure of that gas above the liquid. Mathematically, it is expressed as:

$C = k \cdot P$

where:

- C is the concentration of the gas in the liquid (solubility),
- k is Henry's constant (specific for each gas and solvent),
- P is the partial pressure of the gas above the liquid.

Here's how changes in pressure affect the solubility of a gas in a liquid:

1. **Increasing Pressure:**
    - According to Henry's Law, when the pressure above the liquid increases, the solubility of the gas in the liquid also increases.
    - This means more gas molecules will dissolve in the liquid.
2. **Decreasing Pressure:**
    - Conversely, a decrease in pressure above the liquid will result in a decrease in the solubility of the gas in the liquid.
    - Fewer gas molecules will dissolve in the liquid.
3. **Practical Implications:**
    - This principle is utilized in various applications, including carbonation of beverages. When a carbonated beverage is pressurized (as in a sealed soda can), carbon dioxide dissolves in the liquid. When the can is opened, the pressure decreases, leading to the release of carbon dioxide bubbles.
    - Deep-sea diving is another example. As divers go deeper underwater, the pressure increases. The increased pressure can cause gases, such as nitrogen, to dissolve more readily in the bloodstream. Resurfacing too quickly without allowing the dissolved gases to safely off-gas can lead to decompression sickness.