
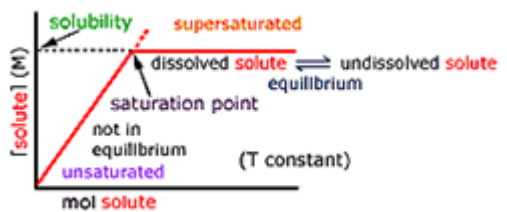



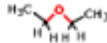



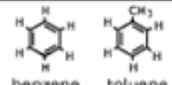
Types of Solutions

key concepts:

- A **solution** is formed by the dissolution of a **solute** in a **solvent**.
- Solutions can be **unsaturated**, **saturated**, or **supersaturated**.
- Like dissolves like. Polar solvents tend to dissolve ionic and polar compounds, and nonpolar solvents tend to dissolve nonpolar compounds.

 <p>solvent + little salt (solute) ⇒ all dissolves into solution Unsaturated solution</p> <p>solution + more salt ⇒ only some dissolves Saturated solution</p>	<p>A solution is formed by the dissolution of a solute in a solvent.</p> <p>The final concentration of solute in a saturated solution depends only on the properties of the solvent and the temperature, not the amount of solute present.</p>
 <p>solubility</p> <p>supersaturated</p> <p>dissolved solute ⇌ undissolved solute equilibrium</p> <p>saturation point</p> <p>not in equilibrium</p> <p>unsaturated</p> <p>(T constant)</p> <p>[solute] (M)</p> <p>mol solute</p>	<p>Solutions can be unsaturated, saturated, or supersaturated.</p> <p>An unsaturated solution is one in which the solute readily dissolves, while a saturated solution cannot dissolve any additional solute. A supersaturated solution contains a solute at concentrations higher than its solubility.</p> <p>As more of the solute is added to a solution, the concentration in solution rises linearly. The saturation point is reached when the concentration of a solute no longer increases with the addition of more solute. The concentration of a solute at the saturation point is referred to as the solute's solubility in the solvent. As more solute is added, the dissolved solute and undissolved solute reach a dynamic equilibrium, where the solute undergoes balanced exchanges between dissolved and undissolved forms.</p>

Types of Solutions

Polar solvents	Nonpolar solvents
<p>H₂O</p> 	<p>Ethers</p>  <p>diethyl ether</p>
<p>Alcohols</p>  <p>methanol</p>	<p>Halocarbons</p>  <p>methylene chloride</p>
<p>Ketones</p>  <p>acetone</p>	<p>Hydrocarbons</p>  <p>benzene toluene</p>

The solubility of a solute in a solvent is influenced by their respective molecular structures. Compounds with high solubilities have relatively weak bonds, while compounds with strong bonds, such as sand or diamond, will be virtually insoluble. Ionic compounds are the exception—while they have strong bonds, polar solvents such as water, which stabilize the ions in solution, can easily dissolve them.

A good rule of thumb is “like dissolves like”. Polar solutes are most soluble in polar solvents such as water, alcohols, and ketones. Nonpolar solutes are most soluble in nonpolar solvents such as ethers, halocarbons, and hydrocarbons.