

LO: Students will be able to explain what dissolving means on a molecular level and how to change the rate of dissolution.

DOL: Students will be able to correctly identify the effects of temp, agitation, and surface area on solutions at least 4/5 times.

Factors that affect the rate of dissolution

- Surface area: the more surface area the solute has, the quicker it will dissolve
- Agitating a solution: the solution closer to the solute is at a higher concentration, by agitating the solution, you allow more solvent to interact with the solute
- Adding heat: with higher temperatures, the particles of the solvent have a higher KE and are thus moving faster. Faster moving particles can more quickly interact with and dissolve the solute

Solubility

-this refers to how much of a solute can be dissolved by a solvent

Solution Equilibrium is the physical state in which the opposing processes of dissolution and crystallization of a solute occur at equal rates.

Saturated Solution is one that contains the maximum amount of dissolved solute

Unsaturated Solution is one in which there is less than the maximum amount of dissolved solute

Feb 16-1:07 PM

Supersaturated Solution is one in which more than the maximum of solute is dissolved in the solution.

This occurs when a solution is saturated at a higher temperature and then is allowed to cool undisturbed. The solute will remain dissolved until it is either agitated or a crystal known as a "seed" is added which causes a chain reaction that allows the solute to fall out of solution.

Feb 16-1:13 PM

Solubility of a substance is the amount of that substance required to form a saturated solution with specific amount of solvent at a specified temperature

Feb 16-1:16 PM

"Like Dissolves Like"

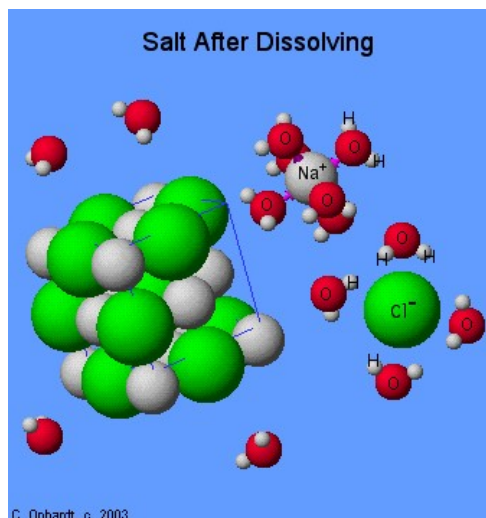
-this is a useful rule to help determine what solutes will dissolve in what solvents

factors involved are the type of bonding, polarity or non-polarity of molecules, and intermolecular forces

Feb 16-1:47 PM

Dissolving Ionic Compounds in Water

Since water is such a polar molecule, ionic compounds separate in solution and the cations are attracted to the O and the anions to the H.



Feb 16-1:51 PM

This process is often referred to as **hydration**.

The ions are said to be **hydrated**.

They are then referred to as **hydrates** which have specific ratios of water molecules in their formulas, such as $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ which has the name of copper (ii) sulfate pentahydrate.

Feb 16-1:58 PM

Nonpolar Solvents

Ionic compounds will not typically dissolve in nonpolar solvents such as carbon tetrachloride. Essentially, there is not enough attraction between the solvent and solute molecules to overcome the attractions between the ionic compounds themselves

Feb 16-2:05 PM