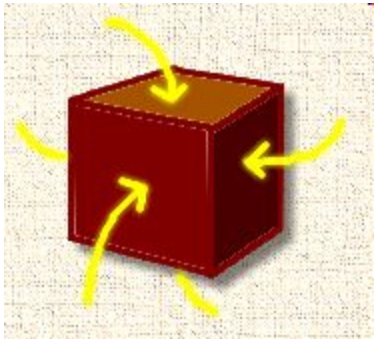
Solutions

Factors Affecting Solubility

Factors Affecting the Rate of Dissolving

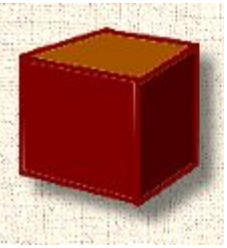
- When a solid is being dissolved in a liquid to form a solution, the dissolving process may occur rapidly or slowly.
- Three factors affect the speed of the dissolving process:

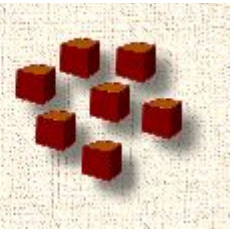
1. *surface area*
2. *stirring*
3. *temperature*



Factors Affecting the Rate of Dissolving

- The dissolving process occurs at the surface of the solid being dissolved, so the greater the amount of surface area exposed to the solvent, the faster the dissolving will occur.
  - **If we want to dissolve a cube of sugar in water, how can we speed up the process?**





- The answer is to grind up the cube into tiny crystals.
- Because the crystals from the ground-up cube expose much more surface area to the water than the original cube did, the sugar dissolves much more quickly.

Factors Affecting the Rate of Dissolving

- The dissolving process is also increased by stirring the solution.
  - Stirring removes newly dissolved particles from the solid surface and continuously exposes the surface to fresh solvent.
- Finally, dissolving occurs more rapidly at higher temperatures.
  - Sugar dissolves quicker in hot than iced tea.
  - Higher temperatures cause the solvent molecules to move more rapidly, thus increasing the rate of the dissolving process.

Factors Affecting the Rate of Dissolving

- In addition to dissolving faster at higher temperatures, most solids are more soluble at higher temperatures.
  - In most cases more solid will dissolve in water at 90 °C than in water at 25 °C.
- The opposite is true for gases dissolved in water.
  - The solubility of a gas in water typically decreases as the temperature increases.

Factors Affecting the Rate of Dissolving

Let's Review

Factors Affecting Dissolving

- Surface area
- Stirring
- Temperature

The End