

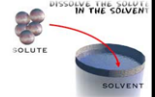
Solutions

Chapter 22



Definitions

- A solution is a _____ (same _____, _____, density, etc.)
- A _____ is dissolved in a _____
 - solute is the substance _____
 - solvent is the _____ in which the solute is dissolved
 - An *aqueous* solution has _____ as solvent
- For example in salt water...
 - Salt is the _____
 - Water is the _____
 - Salt water is an _____



Solutions can also be _____ or _____

- Air is a _____ made up of N_2 , O_2 and trace amounts of other gases.
- _____-special name for _____ solutions.
- Examples of alloys...
 - _____-silver and copper
 - _____-copper and zinc



Dissolving

- Solid in a liquid
Water molecules _____ around solid molecules (_____ ends are attracted to _____ ends), the water molecules pull the sugar molecules into the solution, and then all molecules spread out
- Gas in a liquid
Similar, but particles move _____ than a solid.
- Solid in a solid
_____ and then _____, the atoms spread out evenly and will stay mixed when cooled.

Increase Rate of Dissolving

- _____-brings more fresh solvent into contact with more solute.
- _____-increases _____ allowing more solvent to come into contact with more solute.
- _____-speeds up movement of its particles.



Concentration

- _____ solution- _____ is dissolved in the solvent.
- _____ solution- _____ of solute in the solvent.
- _____ precisely describes the concentration

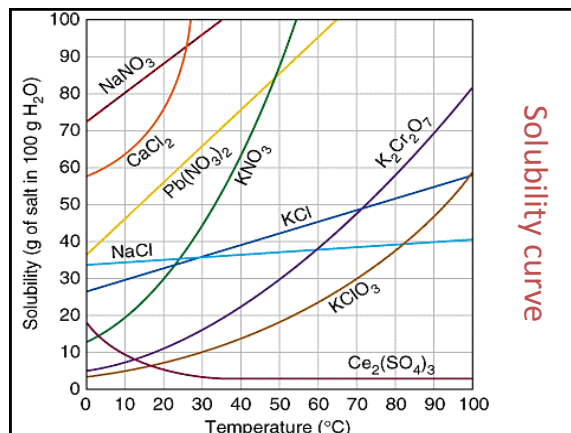


Types of solution (based on amount of solute dissolved)

- A _____ solution is one where the concentration is at a maximum - _____

(if you heat it, more solute could dissolve - _____ affects solubility)

Refer to page ____ in your text book to see a _____. A solubility curve is used to figure out _____ solute will dissolve at a certain _____



Solubility Curve Practice

- What mass of sodium nitrate would have to be dissolved in 100 grams of water to form a saturated solution at 20°C?
- What mass of potassium chlorate would have to be dissolved in 100 grams of water to form a saturated solution at 70°C?
- What mass of solute will dissolve in 100mL of water at the following temperatures.
 - KNO_3 at 50°C
 - NaCl at 100°C
 - NaNO_3 at 10°C

Types of solution (based on amount of solute dissolved)

- A _____ solution is one where the solution can _____.
- A _____ solution is one that contains _____ of the dissolved material than could be dissolved by the solvent under normal circumstances
A supersaturated solution is _____ - _____ from the solution.

Solubility Curve Practice

- 32 grams of potassium nitrate in 100 grams of water at 20°C would be a saturated solution, supersaturated, solution, or unsaturated solution?
- What type of solution would 45.8 grams of potassium chloride in 100 grams of water be at 20°C?

Solubility Curve Practice

- How many grams of NaCl per 100 g of water would be crystallized from a saturated solution as the temperature drops from:
 - 80°C to 20°C
- How many grams of KCl per 100 g of water would be crystallized from a saturated solution as the temperature drops from:
 - 90°C to 10°C
- How many grams of $\text{Pb}(\text{NO}_3)_2$ per 100 g of water would be crystallized from a saturated solution as the temperature drops from:
 - 40°C to 20°C