Help! I'm Dissolving!!! Chapter 15 - Solutions

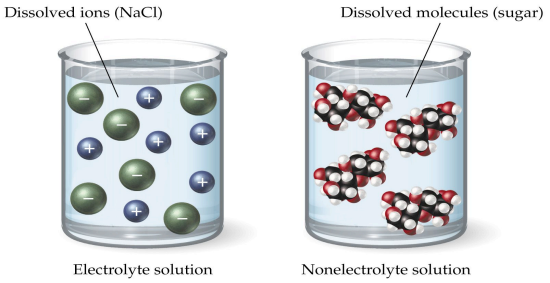
I. Nature of Solutions

A.

1. Substances in a solution can be atoms, molecules or ions.
2. Particles are

B. Two parts of a solution:

1. – substance that is in and is
2. – substance that is in amount and

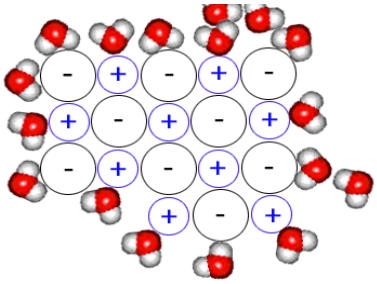


C. Can substances mix?

1. – a substance in another (Ex: lemonade, soda)
   a. a.k.a.
2. – a substance in another (Ex: vinegar and oil)
   b. a.k.a.

D. Some types of solutions

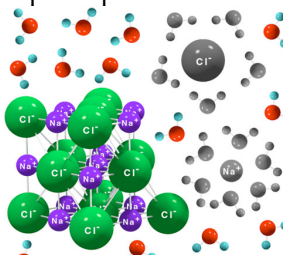
1. (brass and steel)
2. Air (gaseous solution)
3. Solute and solvent are usually in the same state but some can be different.
4. (paint, mud)
5. Solutions
   a. Solutions with
   b. NOTE: aqueous solutions that can are known as...
      i. (because they have ions in solution)
      ii. Examples:



II. The Formation of Solutions

A. How A Solution Forms

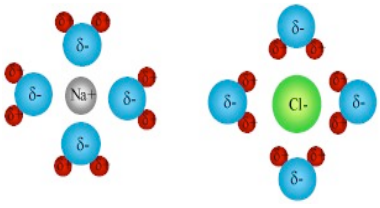
1. When solute is placed in solvent they begin to interact.
   a. How they are pulled apart depends on the solute.
      i. are in compounds.
      ii. are in compounds.
      iii. Polar solvents pull apart polar solutes (including ionic ones) and nonpolar solvents pull apart nonpolar solutes.
      iv.
   b. The each of the dissolved particles.
   c. The solute particles on the outside are dissolved first until...
      i. all the or
      ii. all the



III. Concentration Calculations

A. First, remember density?

1. Density: amount of
2. Formula =



3. The density of water is 1g/mL (1g of H_2O = 1mL of H_2O)
4. Key concept:

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B. Six units are used to measure concentration (Use factor label until it matches!)

Conc. Unit	Symbol	Equation	Units
Grams per liter		_____	
Molarity		_____	
% Composition (by mass)		_____	
Parts per Million		_____	
Molality		_____	
Mole Fraction		_____	

C. To calculate concentration do the following:

1. Determine what concentration you are solving for and write out its units to the right of the equal sign.
2. Write in what is given to the far left (the solute is always on top!)
3. Convert each amount (top and bottom) until it matches the unit needed.
4. Divide!

D. Example: If a solution is prepared from 10.0 grams of NaOH to make 2.00 liters of solution, what is the molarity of the cleaner?

E. Example: If 19.0 g of $C_6H_{12}O_6$ is dissolved in 2.5 kg of water, what is the molality of the solution?

F. Example: A gas mixture contains 50.4 g of N_2O and 65.2 g of O_2. What is the mole fraction of N_2O? Change grams to moles first.

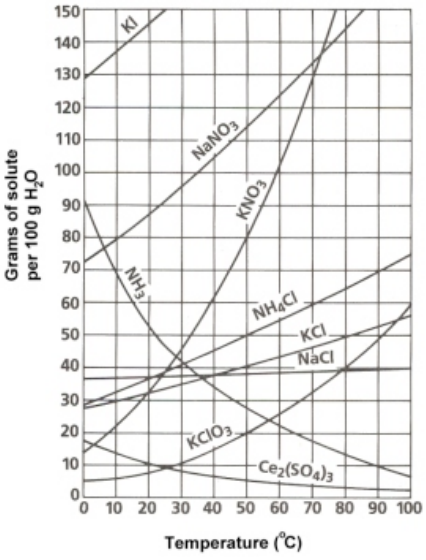
IV. Factors Affecting Solubility

A. under given conditions.

1. Expressed as a
2. Example: At 25 ºC, the solubility of NaCl is 36.2g/100g H_2O.

B. Solubility is affected by:

1.
   a. Only ( )
2.
   a. For solids and most liquids, the
   b. For gases, the
      i. proportional
      ii. Soda goes at room temp.
3.
   a. For gases, the
      i. Like opening a bottle of soda.
   b. This
4.
   a. For solids, the
      i. A packet of sugar than a sugar cube
   b.



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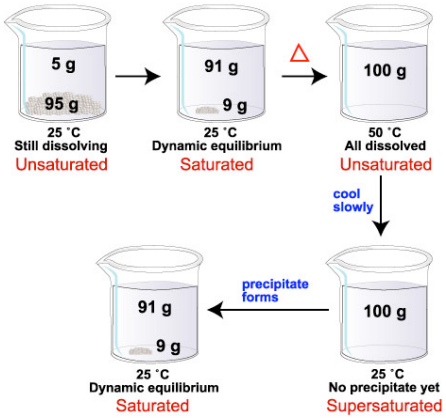
C. Saturation

1. Something is when the solvent can ( ).
2. A solution has (
)
3. = solution that's ( ).
   a. Supersaturated solutions are used to make rock candy!



D. Calculating Solubility

1. Solve it as a ratio:

2. Example:
   How much NaCl can be dissolved in 50g of water at 25°C?

   How about in 25g of water at 100°C?

V. Dilutions

A. To of a solution by

1. To solve for what's needed, the following equation can be used:
   a.
   b. also means that
2. Solution 1 is the and solution 2 is
   a. NOTE: what you solve for is the
   b. You must take into account the original amount of solution you have and