WODSS SCIENCE Name: _____

SCH 3UI Date: _____

Unit 4: Solutions and Solubility

Solubility – the _____ that will dissolve in a given volume or mass of a solvent

- if more of a substance dissolves in one solvent than in a second solvent, the substance is said to be _____ in the first solvent

Soluble – a solid that dissolves in a given liquid

- solubility is _____

Insoluble – a solid that does not dissolve in a given liquid

- solubility is _____

Slightly Soluble – substances with solubility _____

Precipitate – a _____ that forms in solution

Unsaturated Solution – _____ in a given amount of solvent at a particular temperature

Saturated Solution – _____ in a given amount of solvent at a particular temperature

Supersaturated Solution – a solution which contains _____

_____

Types of Solutions

Solution – _____ (same throughout) mixture of two or more substances (see table 8.1 pg. 355)

Solvent – substance that is present in _____ quantity

Solute – substance that is present in _____quantity

- dissolved in the solvent

Ex. 1 sugar water solvent – _____ solute – _____

Dilute Solution – contains a relatively small amount of solute compared to the amount of solvent

Concentrated Solution – contains a relatively _____ amount of solute

Aqueous Solution – solutions made by dissolving solutes in _____

Solubility and Intermolecular Forces

- polar substances dissolve in _____ solvents
- non-polar substances dissolve in _____ solvents
- _____

Dipole-Dipole Attraction – the intermolecular force between _____ charged ends of two polar molecules (molecules with dipoles)

- much _____ than an ionic or covalent bond
  e.g. **Hydrogen Bond** – a relatively strong dipole-dipole force between a positive hydrogen atom of one molecule and a highly electronegative atom (N, O, or F) in another molecule
- much stronger than ordinary dipole-dipole attraction

Ion-Dipole Attraction – the intermolecular forces between _____ and _____molecules

- if ion-dipole attraction can _____ the ionic bonds between the cations and anions in an ionic compound, the compound will dissolve

- however, if the ionic bond is very strong, the compound will be less soluble in water than a compound with a weak ionic bond

Factors That Affect Solubility

Molecule Size – small molecules are often _____soluble than larger molecules

Temperature

– the solubility of **most solids** _____ with temperature

- energy is needed to break bonds between particles in the solid – at higher temperatures, more energy is present

– the solubility of **most liquids is** _____ **greatly affected** by temperature

- the bonds between particles in a liquid are not as strong as the bonds between particles in a solid – additional energy is needed

– the solubility of **gases** _____ **with higher** temperatures

- gas particles have a great deal of kinetic energy – when they dissolve in a liquid they lose some energy (Figure 8.13 pg. 367)
- as a result, the gas comes out of solution and is less soluble

Pressure – the solubility of a gas is _____ to the pressure of the gas above the liquid
e.g. when the pressure of carbon dioxide in a pop bottle is released, the solubility of the gas in the solution decreases

- changes in pressure have _____ on solid and liquid solutions

Factors That Affect The Rate of Dissolving

Temperature – increasing the temperature _____ the rate of dissolving

- the solvent molecules have greater kinetic energy, and therefore collide with the undissolved solid molecules more frequently

Agitation – agitation _____ the rate of dissolving

- agitation brings fresh solvent into contact with undissolved solid

Particle Size – _____ the size of the particles _____ the rate of dissolving

- breaking up solute into smaller pieces increases the surface area that is in contact with the solvent

HW: Read pages 354 to 369 and answer Q#1-6 page 358 Q#2,3,5,14 page 370