Name _____

How Solutions Form

I. Types Of Mixtures

1. Identify the difference between heterogeneous and homogenous mixtures, identify types of each type of solution, and give examples of each type of solution.

1. Heterogeneous Mixture - combination of two or more substances that do not blend smoothly and remain distinct (Ex. - Suspensions, colloids)

Types Of Heterogeneous Mixtures

Suspensions - mixture containing particles that settle out if left undisturbed

Examples - Muddy Water, Sand in Water, Milk of Magnesia

Tyndall Effect - dispersed colloid particles that scatter light

Colloids - mixture of intermediate-sized particles that disperse and do not settle out

Examples - Milk, Fog, Blood, Smoke, Spray Aerosol

2. Homogeneous Mixture - combination of two or more substances that dissolve in a medium (Solute = substance dissolved, Solvent = medium)

Types Of Homogeneous Mixtures

Gas	Solute	Solvent
Example - Air	Oxygen (21%)	Nitrogen (78%)
Example - Nitrous Oxide (N_2O)	Oxygen	Nitrogen
Example - Natural Gas	Hydrocarbons	Methane

Liquid	Solute	Solvent
Example - Ocean Water	NaCl	H_2O
Example - Vinegar	Acetic Acid	H_2O
Example - Anti-freeze	Ethylene Glycol	H_2O

Solid	Solute	Solvent
Example - Steel	Carbon	Iron
Example - Brass	Zinc	Copper
Example - Dental Amalgam (fill cavities)	Mercury	Silver

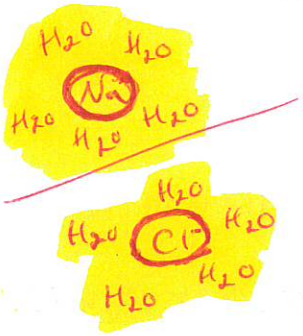
Name _____

II. Solubility

1. **Describe the process of solvation.**

- Process of surrounding solute particles with solvent particles to form a solution
(Solvent-solute attractive forces are greater than solute particles)

2. **How does solvation occur in ionic compounds versus covalent compounds.**



Ionic (table salt) - water molecules surround the Na^+ ions and Cl^- ions until crystal dissolves
(forces of attraction of water is greater than the crystal)

Covalent (sugar) - water molecules collide with outer surface of crystal and O-H sites bind with hydrogen from water until solvation is complete
(attractive forces of sucrose are overcome by water)

3. **What three techniques increase the rate of solvation?**

1. Agitation (Stirring/Shaking) 2. Surface Area (Smaller Pieces) 3. Temperature (↑ typically ↑ rate)

4. **Differentiate between the following types of solutions.**

1. Unsaturated Solution - Contains less dissolved solute for a given temperature + pressure than a saturated solution

Examples : Mist, Iced Coffee, Vinegar (5% acetic acid)

2. Saturated Solution - maximum amount of dissolved solute for a given amount of solvent (at specific temperature and pressure)

Examples : Soda pop, Nes-Quik, Adding Sugar or Salt

3. Supersaturated Solution - Contains more dissolved solute than a saturated solution at same temperature (formed at higher temp. and cooled slowly)

Examples : Soda Water, Honey, Silver Iodide (cloud seeding)

↑ Temp. = ↑ Collisions

5. **Supersaturated solutions are unstable.**

Circle One : (True) False

6. **Write out Henry's Law of gaseous solutes in solutions.**

$$\frac{S_1}{P_1} = \frac{S_2}{P_2}$$

S = Solubility (g/L)
P = Pressure (atm)

7. **Using Henry's Law, explain how carbonated beverages go "flat" when opened.**

1. CO_2 dissolved in solution at higher pressure (than atmospheric)
2. Bottle opened → pressure above solution decreases
3. Bubbles of CO_2 gas form in solution, rise, + escape
4. Process continues until almost all CO_2 escapes