CHEMISTRY ♦ SPRING 2015 ♦ DR. BRESLYN ⓘ	Name: Date:
Water has a high **surface tension** and low vapor pressure due to **hydrogen bonding**. Water **high heat capacity** (energy to raise energy of 1g of water 1°C). Water with dissolved substances is termed an **aqueous solution**. 1 mL of H_2O at 4° has a mass of 1 g **Surface tension** occurs when the molecules are pulled inward to minimize the surface area of the liquid. **Surfactants** (aka wetting agents) reduce the surface tension by interfering with the hydrogen bonding. Soaps and detergents are surfactants (surface active agents).	
Vocabulary **Solvent**: dissolving medium. **Solute**: dissolved particles. **Solvation**: the process of a solute dissolving. **Solubility**: the amount of substance that can dissolve (at a given temperature). A **saturated solution** cannot hold any more solute (at a given temperature). A **supersaturated** solution holds more solute than is theoretically can at a given temperature. Two solutions are **miscible** if they dissolve in each other.	***Like dissolves like.*** *In generally,* polar solvents dissolve polar compounds Nonpolar solvents dissolve nonpolar compounds. ⓘ *Name two liquids that are immiscible.*
Factors Influencing Solubility of a Solid: Agitation (shaking), temperature, and particle size influence how fast a solution forms ⓘ Agitation and particle size do not influence the final concentration Why? For **gases** *in a liquid* increased temperature decreases solubility. Increasing pressure increases solubility.	ⓘ *Why would a gas be less soluble at higher temperatures?* ⓘ*Why would increasing pressure in a gas increase solubility?*
Conductivity of Solutions **Electrolytes** conduct electricity in an aqueous solution or a molten state. **Weak electrolytes** conduct some electricity in an aqueous state. **Nonelectrolytes** do not conduct electricity (e.g. most organic compounds).	Examples: NaCl is a strong electrolyte. NH3 is a weak electrolyte. C_6H_{12} is a nonelectrolyte.

Solutions, Suspensions, and Colloids **Solutions** – smallest particles (less than 1nm). Particles do not settle. **Suspensions** – mixtures where the particles (1 to 1000nm) slowly settle (e.g. clay in water). **Colloids** – smaller particles (greater than 100nm) than suspensions (e.g. gelatin desserts, paint) **Tyndall Effect** – suspensions and colloids scatter light in all directions. **Brownian Motion:** random movement of particles in a colloid. Movement is caused by water molecules bumping into the colloidal particle. **Emulsions**: colloidal dispersions of liquids in liquids (e.g. water and oil dispersed by soap).	
Water of Hydration: water molecules that are part of a crystalline structure (e.g $CuSO_4 \bullet 5H_2O$) **Hygroscopic**: a compound that removes water from the air (e.g. NaOH or H_2SO_4). **Desiccants**: hygroscopic substances used to remove water from air.	
MOLARITY (M) Solution concentration can be expressed qualitatively (e.g. dilute, saturated, supersaturated) and quantitatively (e.g. molarity, % solution) **Concentration** is the amount of solute in a solution. A low concentration is said to be **dilute**. **Molarity** (M) is the number of moles of solute dissolved in one liter of solution. M = moles of dissolved solute/liters of solution or M = moles / liters **Making Dilutions**: when you have a solution you wish to dilute to make a second solution of a different molarity. For example, if I have 200ml of a 3.0M solution of HCl and I want 500ml of 0.1M HCl solution. $M_1 \times V_1 = M_2 \times V_2$ or $M_1V_1 = M_2V_2$ M_1 is the initial molarity and V_1 is the initial volume. M_2 is the final molarity and V_2 is the final volume.	