

Name: _____

Sec #: _____ Date: _____

Chem 1319 – WS16 Solubility Worksheet

A. Solubility Terms

Directions: Fill in the blank with the most appropriate term for the definition given.

Word Bank: Chemical Change, Compound, Electrolyte, Element, Heterogeneous, Homogenous, Matter, Mixture, Physical Change, Precipitate, Soluble, Solute, Solution, Solvent, Supernate

1. _____ Able to dissolve to a certain extent, usually in reference to water.
2. _____ A homogenous mixture of two substances.
3. _____ Changes that alter the composition of matter.
4. _____ Changes that alter only the state or appearance of a substance, but not the composition.
5. _____ The minor (lesser) component in a solution.
6. _____ A pure substance composed of 2 or more elements in a fixed ratio.
7. _____ A solid, insoluble ionic compound that forms in and separates from a solution.
8. _____ The major (greater) component in a solution.
9. _____ The soluble ionic compound that remains in solution.
10. _____ A mixture that has the same composition throughout.
11. _____ A pure substance that cannot be broken down into simpler substances.
12. _____ Anything that occupies space and has mass.
13. _____ A substance composed of 2 or more components in proportions that vary.
14. _____ A mixture where the composition varies from one region to another.
15. _____ A substance that dissolves readily in water (e.g., alkali metal compounds), to form solutions that conduct electricity.

B. Solution Concentration Unit Terms

Directions for Matching: Write the letter corresponding to the **most appropriate definition** for the given word in the blank to the left of the word.

- | | |
|---|--|
| _____ 1. Molarity (M) | a. $\frac{\text{amount of solute (moles)}}{\text{mass of solvent (kg)}}$ |
| _____ 2. Molality (m) | b. $\frac{\text{amount of solute (moles)}}{\text{total of solute + solvent (moles)}}$ |
| _____ 3. Mole Fraction (χ) | c. $\frac{\text{mass of solute}}{\text{mass of solution}} \times 100$ |
| _____ 4. Mole Percentage (mol%) | d. $\frac{\text{amount of solute (moles)}}{\text{volume of solution (L)}}$ |
| _____ 5. Parts by mass(%,ppm,ppb) | e. $\frac{\text{mass of solute}}{\text{mass of solution}} \times 10^9$ |
| _____ 6. Mass Percentage (%) | f. $\frac{\text{volume of solute}}{\text{volume of solution}} \times \text{multiplication factor}$ |
| _____ 7. Parts per million (ppm) | g. $\frac{\text{mass of solute}}{\text{mass of solution}} \times \text{multiplication factor}$ |
| _____ 8. Parts per billion (ppb) | h. $\frac{\text{mass of solute}}{\text{mass of solution}} \times 10^6$ |
| _____ 9. Parts by volume (%,ppm,ppb) | i. $\frac{\text{amount of solute (moles)}}{\text{total of solute + solvent (moles)}} \times 100$ |

C. Dissolution of Ionic Compounds

Directions: Write balanced equations for dissociation of the following substances when they are dissolved in water.

Example:

Ammonium Carbonate – $(\text{NH}_4)_2\text{CO}_3$



1. Sodium Phosphate – Na_3PO_4

2. Sulfuric Acid – H_2SO_4

3. Barium Hydroxide – $\text{Ba}(\text{OH})_2$

4. Strontium Nitrate – $\text{Sr}(\text{NO}_3)_2$

5. Iron (III) Bromide – FeBr_3

D. Solubility Table

Directions: Make your own solubility table. Indicate whether the following combinations of cations (rows) and anions (columns) are soluble in water (W), sparingly soluble (s) or insoluble (I).

	Cl⁻	Br⁻	I⁻	OH⁻	NO₃⁻	C₂H₃O₂⁻	O²⁻	S²⁻	SO₄²⁻	CO₃²⁻	PO₄³⁻
Li⁺											
Na⁺											
K⁺											
NH₄⁺											
Be²⁺											
Mg²⁺											
Ca²⁺											
Sr²⁺											
Ba²⁺											
Al³⁺											
Ag⁺											
Cu⁺											
Cu²⁺											
Fe²⁺											
Fe³⁺											
Pb²⁺											
Sn²⁺											
Sn⁴⁺											
Ni²⁺											