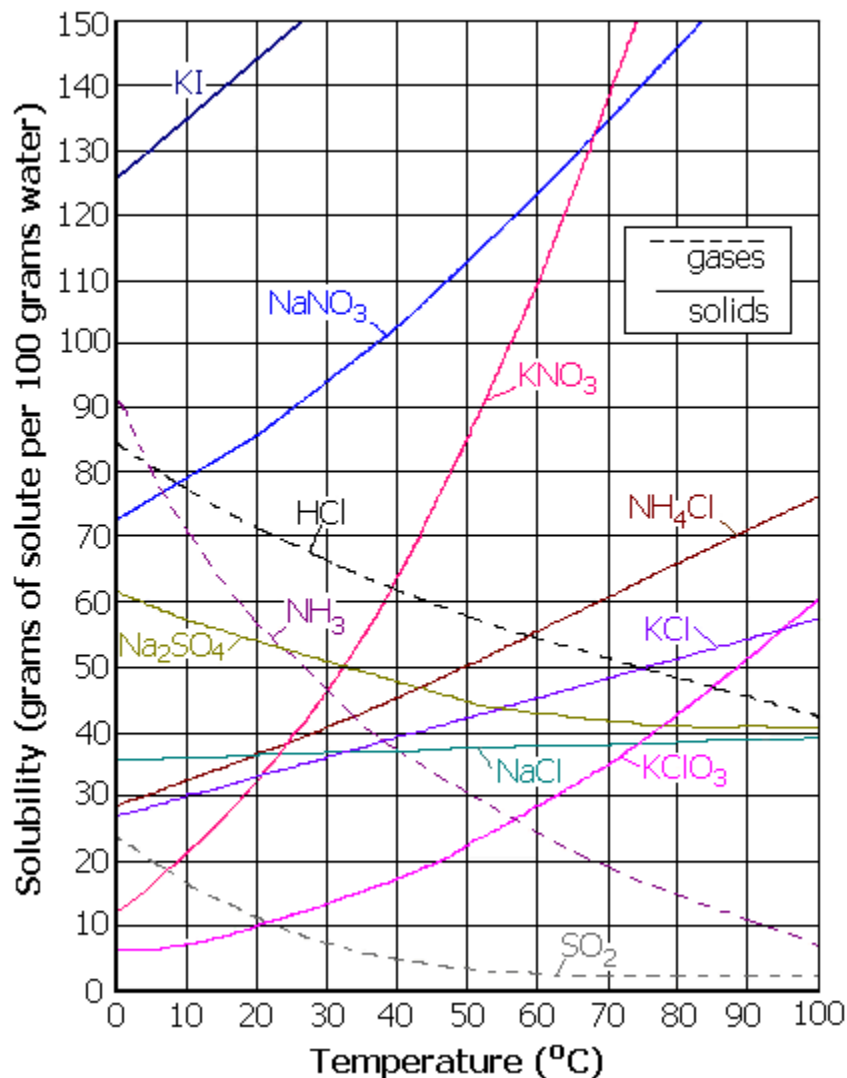


**SOLUBILITY CURVES WORKSHEET**

- Which compound is *least* soluble at: (A) 20°C? (B) 80°C?
- Which substance is the *most* soluble at: (A) 10°C? (B) 50°C? (C) 90 °C?
- The solubility of which substance is *most* affected by changes in temperature?
- The solubility of which substance is *least* affected by changes in temperature?
- Are the following solutions saturated, unsaturated, or supersaturated?  
(Assume all are dissolved in 100 grams of water.)
  - 50 grams of NH<sub>4</sub>Cl at 50°C
  - 100 grams of NaNO<sub>3</sub> at 80°C
  - 30 grams of KNO<sub>3</sub> at 25°C
  - 51 grams of KCl at 80°C
  - 65 grams of NH<sub>4</sub>Cl at 70°C
  - 30 grams of NH<sub>3</sub> at 50°C
  - 10 grams of KClO<sub>3</sub> at 20°C

- 6.)  $\text{NH}_3$  is a gas. Describe what happens to its solubility as the temperature goes from  $20^\circ\text{C}$  to  $80^\circ\text{C}$ .
- 7.) Which two substances have the same solubility at  $68^\circ\text{C}$ ? What is the solubility?
- 8.) Which two substances have the same solubility at  $94^\circ\text{C}$ ? What is the solubility?
- 9.) For each of the following, indicate the temperature at which the solution described would be saturated. (Assume all are dissolved in 100 grams of water.)
- (A) 30 grams of  $\text{NH}_4\text{Cl}$
  - (B) 130 grams of  $\text{NaNO}_3$
  - (C) 50 grams of  $\text{Na}_2\text{SO}_4$
  - (D) 20 grams of  $\text{KNO}_3$
  - (E) 40 grams of  $\text{KCl}$
  - (F) 60 grams of  $\text{NH}_3$
- 10.) For each of these, indicate how many grams of solute (per 100 grams of water) will dissolve.
- (A)  $\text{NaNO}_3$  at  $70^\circ\text{C}$
  - (B)  $\text{NH}_4\text{Cl}$  at  $50^\circ\text{C}$
  - (C)  $\text{KI}$  at  $20^\circ\text{C}$
  - (D)  $\text{KClO}_3$  at  $90^\circ\text{C}$
- 11.) At  $40^\circ\text{C}$ , how many grams of  $\text{NaNO}_3$  will make a saturated solution if the  $\text{NaNO}_3$  is added to 100 grams of water?
- 12.) At  $80^\circ\text{C}$ , how many grams of  $\text{KCl}$  can be dissolved in 200 grams of water?
- 13.) At what temperature will 10 grams of  $\text{NH}_3$  dissolve completely in 100 grams of water to make a saturated solution?
- 14.) At  $40^\circ\text{C}$ , how many grams of  $\text{KNO}_3$  can be dissolved in 300 grams of water?
- 15.) At  $55^\circ\text{C}$ , how many grams of  $\text{NaNO}_3$  can be dissolved in 50 grams of water?
- 16.) At  $80^\circ\text{C}$ , you have a saturated solution of  $\text{KClO}_3$ . How many grams of solid precipitate will form if the solution is cooled to  $50^\circ\text{C}$ ?
- 17.) How many grams of  $\text{NaNO}_3$  precipitate will form if a saturated solution at  $70^\circ\text{C}$  is cooled to  $10^\circ\text{C}$ ?
- 18.) A solution contains 20 g of  $\text{NH}_4\text{Cl}$  at  $50^\circ\text{C}$ . How many more grams of  $\text{NH}_4\text{Cl}$  need to be added to the 100 grams of water for the solution to be saturated?

=====  
**Molarity & Dilutions Worksheet**

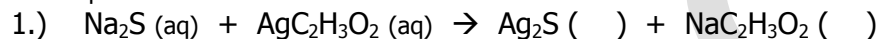
- 1.) What is the molarity of a solution in which 58.5 grams of  $\text{NaCl}$  are dissolved in 1.0 L of solution?
- 2.) What is the molarity of a solution in which 10.0 grams of  $\text{AgNO}_3$  is dissolved in 500. mL of solution?
- 3.) How many grams of  $\text{KNO}_3$  should be used to prepare 2.00 L or a 0.500 M solution?
- 4.) What volume of a 0.25 M solution could be made from 5.0 grams of  $\text{KCl}$ ?

- 5.) How many grams of  $\text{CuSO}_4$  are needed to prepare 100. mL of a 0.10 M solution?
- 6.) How much 18 M sulfuric acid ( $\text{H}_2\text{SO}_4$ ) is needed to prepare 250 mL of a 6.0 M solution?
- 7.) 17 mL of 12 M hydrochloric acid (HCl) is diluted to 100. mL. What is the concentration of the new solution?
- 8.) To what volume should 25 mL of 15 M nitric acid ( $\text{HNO}_3$ ) be diluted to prepare a 3.0 M solution?
- 9.) To what volume should 50. mL of 12 M hydrochloric acid be diluted to produce a 4.0 M solution?
- 10.) If 25.0 mL of 18 M sulfuric acid is diluted to 550. mL, what is the concentration of the diluted solution?

Answers: 1.) 1.0 M; 2.) 0.118 M; 3.) 101 g; 4.) 0.27 L or 270 mL; 5.) 1.6 g; 6.) 83 mL; 7.) 2.0 M; 8.) 130 mL; 9.) 150 mL; 10.) 0.82 M

**NET IONIC EQUATIONS WORKSHEET**

Determine the solubility of the products ((aq) or (s)). Then, write the net ionic equation. Also indicate the spectator ions for each equation.



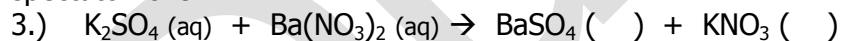
net ionic eqn:

spectator ions:



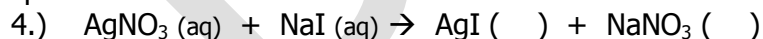
net ionic eqn:

spectator ions:



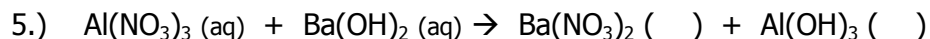
net ionic eqn:

spectator ions:



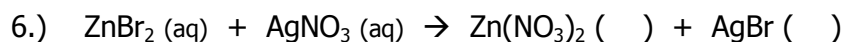
net ionic eqn:

spectator ions:



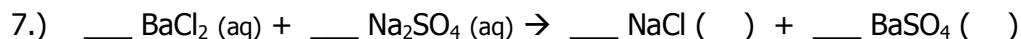
net ionic eqn:

spectator ions:



net ionic eqn:

spectator ions:



net ionic eqn:

spectator ions:

**UNIT 12 REVIEW WORKSHEET**

Part 1 – Solubility Curves - USE YOUR SOLUBILITY CURVE GRAPH TO ANSWER #1-4.

1. At what temperature does 135 grams of KI dissolved in 100 grams of water form a saturated solution?
2. How many grams of  $\text{KNO}_3$  will dissolve in 400 grams of water at  $60^\circ\text{C}$ ?
3. If 10 grams of  $\text{KClO}_3$  are dissolved in 100 grams of water at  $30^\circ\text{C}$ , is the solution saturated, unsaturated, or supersaturated?
4. How many grams of solid precipitate will form if a saturated  $\text{NaNO}_3$  solution is cooled from  $80^\circ\text{C}$  to  $20^\circ\text{C}$ ?

Part 2 – Concentration of Solutions

5. How many grams of  $\text{Fe}(\text{C}_2\text{H}_3\text{O}_2)_3$  are needed to dissolve to make 350. mL of a 2.50 M solution?
6. What is the molarity of a solution made by diluting 17.3 mL of 12 M hydrochloric acid to 550. mL?

Part 3 – Solubility – Write (s) or (aq) next to each product. Then, write the net ionic equation.

7.  $\text{Ca}(\text{NO}_3)_2(\text{aq}) + \text{Na}_2\text{CO}_3(\text{aq}) \rightarrow \text{NaNO}_3(\quad) + \text{CaCO}_3(\quad)$
8.  $\text{Zn}(\text{NO}_3)_2(\text{aq}) + \text{K}_3\text{PO}_4(\text{aq}) \rightarrow \text{KNO}_3(\quad) + \text{Zn}_3(\text{PO}_4)_2(\quad)$