

CHEM 1100 Dr. Stone. Practice Exam 2 questions: Solubility and Molarity

1. Write the net ionic equation for the reaction of cobalt(II) chloride + sodium phosphate
2. Write the net ionic equation for the reaction that takes place between a solution of potassium chloride and a solution of lead(II) nitrate.

- a. $2\text{KCl}(aq) + \text{Pb}(\text{NO}_3)_2(aq) \rightarrow 2\text{KNO}_3(aq) + \text{PbCl}_2(aq)$
- b. $2\text{K}^+(aq) + 2\text{Cl}^-(aq) + 2\text{Pb}^{2+}(aq) \rightarrow 2\text{NO}_3^-(aq) + 2\text{KNO}_3(aq) + \text{PbCl}_2(aq)$
- c. $2\text{K}^+(aq) + 2\text{NO}_3^-(aq) \rightarrow 2\text{KNO}_3(aq)$
- d. $2\text{K}^+(aq) + 2\text{Cl}^-(aq) + 2\text{Pb}^{2+}(aq) \rightarrow 2\text{NO}_3^-(aq) + 2\text{K}^+(aq) + 2\text{NO}_3^-(aq) + \text{PbCl}_2(aq)$
- e. $\text{Pb}^{2+}(aq) + 2\text{Cl}^-(aq) \rightarrow \text{PbCl}_2(s)$
- f. no reaction, the reactant(s) is/are insoluble
- g. no reaction, the product(s) are soluble

3. Which of the following compounds are soluble in water?

- I. NH_4OH II. FeSO_4 III. AgNO_3 IV. PbCO_3
- a. I and III b. II and IV c. I, II, and III d. IV only e. All are soluble.

4. Calcium nitrate is soluble. Write the solubility rule that determines this.

5. Barium hydroxide is soluble. What solubility rule determines this?

- a. All hydroxides are insoluble
- b. All hydroxides are insoluble except with Ca^{+2} , Ba^{+2} , and Sr^{+2}
- c. Alkaline earth metal cations are always insoluble
- d. Barium is always soluble except for hydroxides
- e. None of these

6. What is the molarity of a solution made by adding 25 grams of sodium chloride to 500 mL of water?

- A. 3.4×10^{-2} B. 5.0×10^{-2} C. 4.27×10^{-1} D. 2.9×10^1

7. What mass of barium sulfate (molar mass = 233 g/mol) is produced when 125 mL of a 0.150 M solution of barium chloride is mixed with 125 mL of a 0.150 M solution of iron(III) sulfate?

- a. 7.59g b. 3.65g c. 13.1g d. 18.8g e. 4.37g