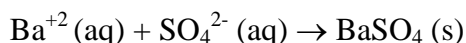


**Chem 11 review – in preparation for the Solubility Equilibrium unit  
- Practice Problems for Assignment 6**

1. If an element “Z” forms a compound with the formula, BaZ, which of the following is a correct chemical formula?
  - a.  $\text{CaZ}_2$
  - b.  $\text{Al}_3\text{Z}_3$
  - c.  $\text{H}_2\text{Z}$
  - d.  $\text{NaZ}_3$
2. If an element “Z” forms an oxide with the formula, ZO, which of the following is a correct chemical formula?
  - a.  $\text{ZH}_4$
  - b.  $\text{Z}_2\text{S}_3$
  - c.  $\text{ZCl}$
  - d.  $\text{ZF}_2$
3. If an element “Z” forms a compound with the formula, AgZ, which of the following is a correct chemical formula?
  - a.  $\text{CaZ}_2$
  - b.  $\text{Al}_3\text{Z}_3$
  - c.  $\text{H}_2\text{Z}$
  - d.  $\text{NaZ}_3$
4. Calculate the molarity of a potassium hydroxide solution that contains 0.015 grams of potassium hydroxide in 0.348 L of solution.
5. What volume of 1.191 M nitric acid must be diluted with water to prepare 250 mL of 0.79 M nitric acid.
6. Water is evaporated from 292 mL of 1.191 M nitric acid solution until the solution volume becomes 172.543 mL. What is the molarity of nitric acid that results?
7. Sulfuric acid,  $\text{H}_2\text{SO}_4$ , and potassium hydroxide, KOH, solutions are mixed. Does a reaction occur? If so, write the balanced chemical reaction.
8. Write the chemical formula for:
  - a. sodium acetate
  - b. chromium (III) sulfate
  - c. lead (II) oxide
  - d. phosphoric acid
  - e. sodium phosphate
9. What are the molar concentrations of the ions in 0.20 M aluminum sulfate?
10. What are the molar concentrations of the ions in 0.40 M  $\text{FeCl}_3$ ?
11. How many milliliters of 0.100 M  $\text{AgNO}_3$  solution are needed to react completely with 25.0 mL of 0.400 M  $\text{CaCl}_2$  solution?
12. A solution containing  $\text{Na}_2\text{SO}_4$  was treated with 0.150 M  $\text{BaCl}_2$  solution until all the sulfate ion had reacted to form  $\text{BaSO}_4$ . The reaction



The reaction required 28.40 mL of the  $\text{BaCl}_2$  solution. How many grams of  $\text{Na}_2\text{SO}_4$  were in the solution?

13. Suppose that 25.0 mL of 0.440 M NaCl is added to 25.0 mL of 0.320 M  $\text{AgNO}_3$ .
  - (a) How many moles of AgCl would precipitate?
  - (b) What would be the concentration of each of the ions in the reaction mixture after the reaction?

**Answers:**

1. c
2. d
3. a
4. 0.00077 M
5. 166 mL
6. 2.02 M
7.  $\text{H}_2\text{SO}_4 (\text{aq}) + 2 \text{KOH} (\text{aq}) \rightarrow \text{K}_2\text{SO}_4 (\text{aq}) + 2 \text{H}_2\text{O} (\text{l})$
8. a.  $\text{NaC}_2\text{H}_3\text{O}_2$   
b.  $\text{Cr}_2(\text{SO}_4)_3$   
c.  $\text{PbO}$   
d.  $\text{H}_3\text{PO}_4$   
e.  $\text{Na}_3\text{PO}_4$
9. Aluminum sulfate is  $\text{Al}_2(\text{SO}_4)_3$ .  $[\text{Al}^{3+}] = 0.40 \text{ M}$ ,  $[\text{SO}_4^{2-}] = 0.60 \text{ M}$
10.  $[\text{Fe}^{3+}] = 0.40 \text{ M}$ ,  $[\text{Cl}^-] = 1.20 \text{ M}$
11. 200 mL
12. 0.605 g
13. 0.008 mole  $\text{AgCl}$  forms.  
 $[\text{Na}^+] = 0.220 \text{ M}$ ,  $[\text{NO}_3^-] = 0.160 \text{ M}$ ,  $[\text{Ag}^+] = 0$ ,  $[\text{Cl}^-] = 0.060 \text{ M}$