

## Tutorial 0010

1. Predict whether the following reactions occur. If a reaction occurs, balance the chemical equation.

(a) Calcium metal was placed in hydrochloric acid.

(b) A solution of copper (II) sulfate,  $\text{CuSO}_4$ , was poured into a galvanized (zinc-coated) bucket.

(c) Copper metal was dipped in a solution of sodium chloride,  $\text{NaCl}$ .

(d) Silver nitrate,  $\text{AgNO}_3$ , and potassium chloride,  $\text{KCl}$ , are mixed.

(e) Potassium chloride,  $\text{KCl}$ , is mixed with iodine,  $\text{I}_2$ .

(f) Aluminum sulfate,  $\text{Al}_2(\text{SO}_4)_3$ , and barium nitrate,  $\text{Ba}(\text{NO}_3)_2$ , solutions are mixed.

(g) Sulfuric acid,  $\text{H}_2\text{SO}_4$ , and potassium hydroxide,  $\text{KOH}$ , solutions are mixed.

(h) A potassium bromide,  $\text{KBr}$ , solution is mixed with chlorine,  $\text{Cl}_2$ , gas.

2. Calculate each of the following quantities:

a) grams of solute in 175.8 mL of 0.207 M Calcium Acetate,  $\text{Ca}(\text{CH}_3\text{COO})_2$

*(5.749 g)*

b) molarity of 500.0 mL of solution containing 21.1 g of potassium iodide,

*(0.14M)*

3. Calculate the volume (in mL) of a 0.5 M KOH solution that is needed to neutralize completely a 30.0 mL of a 0.1 M  $\text{H}_3\text{PO}_4$  solution.

*(18.0 mL)*

4. Calculate volume in liters of 2.26 M potassium hydroxide, KOH, which contains 8.42 g of solute.

*(0.0610 M)*

5. Calculate the molarity of the solution that was prepared by diluting:

a. 37.00 mL of 0.250 M potassium chloride, NaCl, to 150.00 mL.

*(0.0610 M)*

b. 25.71 mL of 0.0706 M ammonium sulfate,  $\text{NH}_4\text{SO}_4$ , to 500.00 mL.

*(0.0036 M)*

6. Calculate the volume of 0.3 M  $\text{Ca}(\text{OH})_2$  solution that is needed to neutralize completely a 20.0 mL of 0.1 M HCl solution.

*(3.33 mL)*

7. Write the net ionic reaction to the following acid base reaction:

