TITRATION PROBLEMS

1. a) In a titration experiment, 28.50 mL of 0.50 mol dm^{-3} $H_2SO_{4(aq)}$ were required to neutralize 25.00 mL of $NaOH_{(aq)}$. What was the concentration of the $NaOH_{(aq)}$?
   b) Write the non-ionic equation.
   c) Write the total ionic equation.
   d) Write the net ionic equation.

2. What volume of 0.350 molL^{-1} KOH is required to neutralize:
a) 20.0 mL of 0.200 mol L^{-1} acetic acid, CH_3COOH
b) 20.0 mL of 0.200 mol L^{-1} phosphoric acid, H_3PO_4

3. Calculate the concentration of nitric acid, $HNO_{3(aq)}$, if 20.00 mL of the acid is completely neutralized by 15.50 mL of 0.100 mol L^{-1} barium hydroxide.

4. Calculate the concentration of a $KOH_{(aq)}$ if 42.50 mL of this neutralizes 25.00 mL of 0.301 mol L^{-1} perchloric acid, $HClO_{4(aq)}$.

5. 0.2 g of oxalic acid, $H_2C_2O_4$ was neutralized with 35.5 mL of $NaOH_{(aq)}$. Determine the concentration of the $NaOH_{(aq)}$.

6. How many grams of calcium oxide will be able to dissolve in (i.e. react with) 35.50 mL of 0.25 mol L^{-1} nitric acid.

7. If 5.25 g of barium hydroxide, $Ba(OH)_{2(aq)}$, is to be neutralized with 0.200 molL^{-1} phosphoric acid, $H_3PO_{4(aq)}$, what volume of acid would be required for complete reaction?

8. A sample of 10.00 mL of ammonia solution is titrated with 20.50 mL of 0.145 mol L^{-1} $HCl_{(aq)}$. What is the concentration of the ammonia solution?

9. If 10.0 mL of $KOH_{(aq)}$ reacts with 0.955 g of oxalic acid, $H_2C_2O_4$, determine the concentration of the $KOH_{(aq)}$.

10. What mass of hydrogen bromide is dissolved in 500 mL of a hydrochloric acid, $HCl_{(aq)}$ solution, if 25.0 mL of this solution is neutralized by 20.0 mL of 0.67 mol L^{-1} $NaOH_{(aq)}$?