Molarity- Stoichiometry Set II

1. What volume (in mL) of 0.8 M HNO_3 (nitric acid) is required to neutralize 50 mL of a 0.2 M $Mg(OH)_2$ solution? Start by writing a balanced neutralization reaction. (25 ml)

2. Given the following reaction: $2 Al_{(s)}$ + $6 HCl_{(aq)} \rightarrow 2 AlCl_{3(aq)}$ + $3 H_{2(g)}$
   Given 100 ml of 6 M HCl, how many grams of aluminum could you react? (5.4 g Al)

3 (LR). An ace chemistry student mixes 50 ml of a 0.15 M $Cu(NO_3)_2$ solution with 50 ml of a 0.4 M KI solution and observes that a dark brown solid is formed. The products of this reaction are copper(II) iodide and potassium nitrate.
   (a) Write a balanced equation for this reaction.

   (b) How many grams of solid copper(II) iodide are made ? (2.38 g)

   (c) After the reaction is over, calculate the molarity of excess reagent remaining? (0.05 M)

4 (LR). Given the reaction: $2\ HCl_{(aq)}\ +\ Na_2CO_3\ \rightarrow 2\ NaCl_{(aq)}\ +\ H_2O_{(l)}\ +\ CO_{2(g)}$

   (a) How many grams of carbon dioxide are made when 300 ml of 2 M HCl and 21.2 g sodium carbonate are allowed to react ? (8.8 g)

   (b) What is the concentration (molarity) of the HCl after the reaction is complete. Assume that solution remains at 300 ml. (0.66 M HCl)

5 (LR). Given: $2\ AgNO_{3(aq)}\ +\ CaCl_{2(aq)}\ \rightarrow\ 2\ AgCl_{(s)}\ +\ Ca(NO_3)_{2(aq)}$

   (a) When 160 ml of 0.1M $AgNO_3$ and 100 ml of 0.2 M $CaCl_2$ are mixed , how many grams of solid silver chloride are made ? (2.29g)

   (b) What is the molarity of the excess reagent after the reaction is over. Assume that the volume of the solution remains constant. (0.046 M)

   (c) Calculate the molarity of the resulting calcium nitrate solution once the reaction is over. Assume the volume of the solution remains constant.   (0.031 M)