CHM 1142   Homework Set 5

1)   Answer the questions concerning this reaction:

$$CaC_2 \quad + \quad H_2O \quad = \quad C_2H_2 \quad + \quad Ca(OH)_2$$

a) How many moles of H_2O are required to react with 0.10 moles CaC_2

b) How many g of C_2H_2 could be produced from 6.4 g of CaC_2?

c) How many g of CaC_2 reacted if 5.0 g of $Ca(OH)_2$ are produced?

d) How many g of H_2O are consumed if 2.0 g of $Ca(OH)_2$ are produced?

2)   Write net ionic equations for the reactions that occur when dilute aqueous solutions of the following are mixed:

a) sodium hydroxide and ferric nitrate

b) potassium iodide and silver nitrate

c) lead (II) nitrate and sodium chloride

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3)

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) There are _____ atoms of oxygen are in 300 molecules of CH_3CO_2H. 1) _____
   A) 300
   B) 3.61×10^{26}
   C) 1.80×10^{26}
   D) 600
   E) 3.01×10^{24}

2) Propane (C_3H_8) reacts with oxygen in the air to produce carbon dioxide and water. In a 2) _____
   particular experiment, 38.0 grams of carbon dioxide are produced from the reaction of 22.05
   grams of propane with excess oxygen. What is the % yield in this reaction?
   A) 66.0   B) 94.5   C) 38.0   D) 86.4   E) 57.6

3) Which of the following is soluble in water at 25 °C? 3) _____
   A) FeS
   B) $FeCO_3$
   C) $Fe(NO_3)_2$
   D) $Fe_3(PO_4)_2$
   E) $Fe(OH)_2$

4) Which of the following is insoluble in water at 25 °C? 4) _____
   A) $Ba(C_2H_3O_2)_2$
   B) $(NH_4)_2CO_3$
   C) $Ca(OH)_2$
   D) $Mg_3(PO_4)_2$
   E) Na_2S

5) Which combination will produce a precipitate? 5) _____
   A) $Pb(NO_3)_2$ (aq) and HCl (aq)
   B) NaOH (aq) and $Sr(NO_3)_2$ (aq)
   C) KOH (aq) and HNO_3 (aq)
   D) $AgC_2H_3O_2$ (aq) and $HC_2H_3O_2$ (aq)
   E) $Cu(NO_3)_2$ (aq) and $KC_2H_3O_2$ (aq)

6) What volume (mL) of a concentrated solution of sodium hydroxide (6.00 M) must be diluted to 6) _____
   200. mL to make a 1.50 M solution of sodium hydroxide?
   A) 0.0500   B) 0.800   C) 800.   D) 50.0   E) 45.0

7) A compound that is composed of carbon, hydrogen, and oxygen contains 70.6% C, 5.9% H, and 7) _____
   23.5% O by mass. The molecular weight of the compound is 136 amu. What is the molecular
   formula?
   A) $C_5H_6O_2$ B) C_4H_4O C) C_8H_4O D) $C_9H_{12}O$ E) $C_8H_8O_2$

8) The molarity of a solution prepared by diluting 43.72 mL of 1.005 M aqueous $K_2Cr_2O_7$ to 500. 8) _____
   mL is _____.
   A) 0.0218   B) 0.0115   C) 0.870   D) 87.9   E) 0.0879

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