CHEM111 Name _____
College of Charleston
Spring 2002
Exam II Score _____ /100

1(24). Circle the letter that represents the best response to each item.

Which gives an acidic solution in water?
(A) H_2 (B) CH_4 (C) NH_3 (D) CaO (E) SO_2

Once the following equation is balanced using no fractional coefficients

$$\_\_ C + \_\_ HNO_3 \rightarrow \_\_ CO_2 + \_\_ NO_2 + \_\_ H_2O$$

what is the sum of the coefficients?
(A) 5 (B) 7 (C) 9 (D) 12 (E) 16

Once the following equation is balanced

$$\_\_ N_2H_4 + \_\_ N_2O_4 \rightarrow \_\_ N_2 + \_\_ H_2O$$

how many moles of N_2 will be produced for every mole of N_2O_4 that reacts?
(A) one (B) two (C) three (D) four

Manganese has the oxidation number of +5 in
(A) $[MnF_6]^{3-}$ (B) Mn_2O_7 (C) $[MnO_4]^{2-}$ (D) $[Mn(CN)_6]^{-}$

Chlorine has its highest oxidation number in
(A) HCl (B) HClO (C) $HClO_2$ (D) $HClO_3$ (E) $HClO_4$

Which statement is true for the reaction

$$Fe(s) + Cu^{2+}(aq) \rightarrow Cu(s) + Fe^{2+}(aq)$$

(A) Cu^{2+} is oxidized (B) Cu^{2+} gains in oxidation state
(C) Cu^{2+} is reduced (D) Fe(s) is reduced

To 1.0 mol of each of the following compounds, 1.00 L of water is added. Which of the resulting solutions will exhibit the highest conductivity?
(A) CH_3COOH (B) KCl (C) $C_6H_{12}O_6$ (D) CuS

Which two compounds would react by exchange ("double displacement") upon mixing equal volumes of their dilute solutions?
(A) $NaNO_3$ and $CuSO_4$ (B) $CuCl_2$ and $CuBr_2$
(C) $BaCl_2$ and $CuSO_4$ (D) NH_4Cl and $CuSO_4$

2(20). What mass of aluminum oxide is formed by the reaction of 65.3 g of aluminum and 30.2 g of oxygen and what mass of which reactant, if any, will be in excess?

$$4\ Al(s) + 3\ O_2(g) \rightarrow 2\ Al_2O_3(s)$$

3(10). In the “electric pickle” Thinkwell demo, why did the current pass and what caused the color?

4(10). Disulfur dichloride can be prepared by

$$3\ SCl_2 + 4\ NaF \rightarrow SF_4 + S_2Cl_2 + 4\ NaCl$$

Determine the percent yield if 5.234 g SCl_2 in excess NaF yields 1.191 g S_2Cl_2.

5(36). Balance these reactions and then classify each one as either redox or as precipitation, acid-base, or gas-forming exchange (circle the response). Under each, write the net ionic equation.

Redox Precip acidbase gas __ $Ba(OH)_2(s)$ + __ $HCl(aq) \rightarrow$ __ $BaCl_2(aq)$ + __ $H_2O(l)$

Redox Precip acidbase gas __ $HNO_3(aq)$ + __ $CoCO_3(s) \rightarrow$ __ $Co(NO_3)_2(aq)$ + __ $H_2O(l)$ + __ $CO_2(g)$

Redox Precip acidbase gas __ $Na_3PO_4(aq)$ + __ $Cu(NO_3)_2(aq) \rightarrow$ __ $Cu_3(PO_4)_2(s)$ + __ $NaNO_3(aq)$

Redox Precip acidbase gas __ $CdCl_2(aq)$ + __ $Na_2S(aq) \rightarrow$ __ $CdS(s)$ + __ $NaCl(aq)$

Redox Precip acidbase gas __ $Ca(s)$ + __ $O_2(g) \rightarrow$ __ $CaO(s)$

Redox Precip acidbase gas __ $Ca(OH)_2(s)$ +__ $HCl(aq) \rightarrow$ __ $CaCl_2(aq)$ + __ $H_2O(l)$