CHM151 Quiz 4 25 Pts Fall 2013 Name: Key

1. (2 Pts) Give the formulas for one strong acid and one strong base. Acid_____Base_____

2. (3 Pts) What is the potassium ion concentration in 100.0 mL of 2.5 M K_3PO_4 solution?

$3 \times 2.5 = 7.5M$

3. (12 Pts) Write the balanced molecular total ionic and net ionic equations for the following reactions. If no reaction is expected, write "no reaction."

a. $CaCl_2(aq) + Na_2CO_3(aq) \rightarrow CaCO_3(s) + 2NaCl(aq)$

Total ionic eq: $Ca^{2+} + 2Cl^- + 2Na^+ + CO_3^{2-} \rightarrow CaCO_3(s) + 2Na^+ + 2Cl^-$

Net ionic eq: $Ca^{2+} + CO_3^{2-} \rightarrow CaCO_3(s)$

b. $H_2SO_4(aq) + 2NaOH(aq) \rightarrow 2H_2O(l) + Na_2SO_4(aq)$

Total ionic eq: $H^+ + HSO_4^- + 2Na^+ + 2OH^- \rightarrow 2H_2O(l) + 2Na^+ + SO_4^{2-}$

(5) $2H^+ + SO_4^{2-} + 2Na^+ + 2OH^- \rightarrow 2H_2O + 2Na^+ + SO_4^{2-}$

Net ionic eq: $H^+ + HSO_4^- + 2OH^- \rightarrow 2H_2O + SO_4^{2-}$

(2) $2H^+ + 2OH^- \rightarrow 2H_2O$

c. weak acid $HF(aq) + NaOH(aq) \rightarrow H_2O(l) + NaF(aq)$

Total ionic eq: $HF + Na^+ + OH^- \rightarrow H_2O(l) + Na^+ + F^-$

Net ionic eq: $HF + OH^- \rightarrow H_2O(l) + F^-$

*This format is true for weak acids with st. bases

4. (4 Pts) Which substance is acting as a Brønsted acid in the following reactions?

a. $HSO_4^- + NH_4^+ \rightarrow H_2SO_4 + NH_3$ NH_4^+

b. $NH_3(g) + H_2O(l) \rightarrow NH_4^+ + OH^-$ H_2O

5. (4 Pts) Complete and balance each of the following reactions.

a. $2H_3PO_4(aq) + 3Ba(OH)_2(aq) \rightarrow 6H_2O(l) + Ba_3(PO_4)_2(s)$

b. $3HCH_3COO(aq) + Al(OH)_3(aq) \rightarrow Al(CH_3COO)_3(aq) + 3H_2O(l)$