CHM151 Quiz 4a 25 Pts Fall 2014 Name: Key

Show all work to receive credit.

1. (8 Pts) Write total and net ionic equations for each the following: (**Watch for Weak acids**)

a. $Pb(NO_3)_2(aq) + 2NH_4Cl(aq) \rightarrow 2NH_4NO_3(aq) + PbCl_2(s)$

total ionic: $Pb^{2+} + 2NO_3^- + 2NH_4^+ + 2Cl^- \rightarrow 2NH_4^+ + 2NO_3^- + PbCl_2(s)$

Net ionic: $Pb^{2+} + 2Cl^- \rightarrow PbCl_2(s)$

b. (H_3PO_4 weak acid) $H_3PO_4(aq) + 3NaOH(aq) \rightarrow 3H_2O(l) + Na_3PO_4(aq)$

total ionic: $H_3PO_4(aq) + 3Na^+ + 3OH^- \rightarrow 3H_2O(l) + 3Na^+ + PO_4^{3-}$

Net ionic: $H_3PO_4 + 3OH^- \rightarrow 3H_2O(l) + PO_4^{3-}$

2. (4 Pts) Determine the molarity of a solution that is prepared by dissolving 14.7 g of $Ca(OH)_2$ in water to give a total volume of 500.0 mL. (Molar Masses: Ca 40.08, H 1.008, O 16.00)

$$\frac{14.7\ g\ Ca(OH)_2}{0.5000\ L} \left| \frac{mol}{74.096\ g} \right. = 0.397\ \frac{mol\ Ca(OH)_2}{L}$$

3. (4 Pts) A solution is prepared by taking 55.0 mL of 0.500 M HCl and diluting it to a volume of 400.0 mL. What is the molarity of the new solution?

$M_1V_1 = M_2V_2$ $\quad \frac{(55.0\ mL)(0.500\ M)}{400.0\ mL} = 0.0688\ M$

4. (6 Pts) How many grams of KOH would be required to neutralize 47.0 mL of 3.00 M H_2SO_4 solution? (Molar masses: K 39.01, O 16.00, H 1.008)

$H_2SO_4(aq) + 2KOH(s) \rightarrow 2H_2O(l) + Na_2SO_4(aq)$

47.0 mL H_2SO_4 | 3.00 mol H_2SO_4 / 1000 mL H_2SO_4 | 2 mol KOH / 1 mol H_2SO_4 | 56.019 g KOH / mol KOH = 15.8 g KOH

5.(3 Pts) Give the formulas for any three strong acids. _____ _____ _____

CHM151 Quiz 4b 25 Pts Fall 2014 Name: Key

Show all work to receive credit.

1. (8 Pts) Write total and net ionic equations for each the following: (**Watch for Weak acids**)

a. $Pb(NO_3)_2(aq) + 2KCl(aq) \rightarrow 2KNO_3(aq) + PbCl_2(s)$

total ionic: $Pb^{2+} + 2NO_3^- + 2K^+ + 2Cl^- \rightarrow 2K^+ + 2NO_3^- + PbCl_2(s)$

Net ionic: $Pb^{2+} + 2Cl^- \rightarrow PbCl_2(s)$

b. weak acid

$H_3AsO_4(aq) + 3NaOH(aq) \rightarrow 3H_2O(l) + Na_3AsO_4(aq)$

total ionic: $H_3AsO_4(aq) + 3Na^+ + 3OH^- \rightarrow 3H_2O(l) + 3Na^+ + AsO_4^{3-}$

Net ionic: $H_3AsO_4(aq) + 3OH^- \rightarrow 3H_2O(l) + AsO_4^{3-}$

2. (4 Pts) Determine the molarity of a solution that is prepared by dissolving 19.7 g of $Ca(OH)_2$ in water to give a total volume of 400.0 mL. (Molar Masses: Ca 40.08, H 1.008, O 16.00)

$$\frac{19.7\,g}{0.4000\,L} \left| \frac{mol}{74.096\,g} \right. = 0.665\ \frac{mol\ Ca(OH)_2}{L}$$

3. (4 Pts) A solution is prepared by taking 35.0 mL of 0.500 M HCl and diluting it to a volume of 500.0 mL. What is the molarity of the new solution?

$M_1V_1 = M_2V_2$

$$\frac{(35.0\,mL)(0.500\,M)}{500.0\,mL} = 0.0350\,M$$

4. (6 Pts) How many grams of KOH would be required to neutralize 27.0 mL of 3.00 M H_2SO_4 solution? (Molar masses: K 39.01, O 16.00, H 1.008)

$H_2SO_4(aq) + 2KOH(s) \rightarrow 2H_2O(l) + Na_2SO_4(aq)$

$$\frac{27.0\,mL\ H_2SO_4}{} \left| \frac{3.00\,mol\ H_2SO_4}{1000\,mL\ H_2SO_4} \right| \frac{2\,mol\ KOH}{1\,mol\ H_2SO_4} \left| \frac{56.0186\,g\ KOH}{mol\ KOH} \right. = 9.08\,g\ KOH$$

5.(3 Pts) Give the formulas for any three strong acids. _____ _____ _____