Green

Quiz IV General Chemistry I Lecture Spring 15 Dr. Hahn 20 pts 2/24 T 8:30am form A quiz # _____

Name Key (print name) Name _____ (sign name)

Please show all work for full credit and for partial credit.

1. Given the following reaction, what is the theoretical yield of N_2 (FW = 28.02 g/mol) (in grams) if you start out with 55.2 grams of NH_3 (FW = 17.04 g/mol) and an excess of all other needed reagents. (8 pts)

$4\ NH_3 + 3\ O_2 \rightarrow 2\ N_2 + 6\ H_2O$

$55.2\ g\ NH_3 \times \frac{mol\ NH_3}{17.04\ g\ NH_3} \times \frac{2\ mol\ N_2}{4\ mol\ NH_3} \times \frac{28.02\ g\ N_2}{1\ mol\ N_2} = 45.38\ g$

45.4 g N_2 3 sig figs

2 If you weigh out 78.2 grams of $NaNO_3$ (FW = 85.01 g/mol) and make up 1.5 Liters of the solution, what is the molarity of the solution. (6 pts)

$78.2\ g\ NaNO_3 \times \frac{mol\ NaNO_3}{85.01\ g\ NaNO_3} = 0.920\ mol\ NaNO_3$

$1.5\ L \times \frac{1000\ mL}{1\ L}$

$M\ NaNO_3 = 0.920\ mol\ NaNO_3 / 1.5\ L\ soln = 0.613\ M$

2. If you have the following ionic compound, is the reagent soluble or insoluble in water. Explain your answer in a few words. (6 pts)

PbI_2 I- usually soluble except Pb^{2+} iodide is insoluble

insoluble

Extra Credit (2 pts) a. Given the following reactants, write out the products by filling in the blanks for the **molecular equation**. You do not need to balance the reactions in either part of this question. (1 pt)

$AgNO_3\ (aq) + LiBr\ (aq) \rightarrow$ AgBr (s) + $LiNO_3$ (aq)

b. Complete the following **complete ionic equation** for the same reaction (1 pt)

$Ag^{+1}(aq) + NO_3^{-1}(aq) + Li^{+1}(aq) + Br^{-1}(aq) \rightarrow$ AgBr(s) + $Li^{+1}(aq)$ + NO_3^- (aq)

Quiz IV General Chemistry I Lecture Spring 15 Dr. Hahn 20 pts 2/24 T 8:30am form B quiz # _____

Name Key (print name) Name _____ (sign name)

Please show all work for full credit and for partial credit.

1. Given the following reaction, what is the theoretical yield of H_2O (FW = 18.02 g/mol) (in grams) if you start out with 98.2 grams of O_2 (FW = 32.00 g/mol) and an excess of all other needed reagents. (8 pts)

4 NH_3 + 3 O_2 → 2 N_2 + 6 H_2O

$98.2\,g\,O_2 \times \frac{mol\,O_2}{32.00\,g\,O_2} \times \frac{6\,mol\,H_2O}{3\,mol\,O_2} \times \frac{18.02\,g\,H_2O}{1\,mol\,H_2O} = 110.6$

111 g H_2O

2. If you weigh out 37.8 grams of Na_2SO_4 (FW = 142.07 g/mol) and make up 0.75 Liters of the solution, what is the molarity of the solution. (6 pts)

$37.8\,g\,Na_2SO_4 \times \frac{mol\,Na_2SO_4}{142.07\,g\,Na_2SO_4} = 0.266\,mol\,Na_2SO_4$

$M\,Na_2SO_4 = 0.266\,mol\,Na_2SO_4 / 0.75\,l = 0.355\,M\,Na_2SO_4$

3. If you have the following ionic compound, is the reagent soluble or insoluble in water. Explain your answer in a few words. (6 pts)

$(NH_4)_2S$ S^{-2} usually insoluble, NH_4^+ is exception → soluble

Extra Credit (2 pts) a. Given the following reactants, write out the products by filling in the blanks in the **molecular equation**. You do not need to balance the reactions in either part of this question. (1 pt)

Li_2CO_3 (aq) + $Ba(NO_3)_2$ (aq) → $BaCO_3$ (s) + $2LiNO_3$ (aq)

b. Complete the following **complete ionic equation** for the same reaction (1 pt)

$2\,Li^+$ (aq) + CO_3^{-2} (aq) + Ba^{+2} (aq) + $2NO_3^{-1}$ (aq) → $BaCO_3$ (s) + $2Li^+$ (aq) + $2NO_3^{-1}$ (aq)

yellow

Quiz IV General Chemistry I Lecture Spring 15 Dr. Hahn 20 pts 2/24 T 9:55am form A quiz # _____

Name Key (print name) Name _____ (sign name)

Please show all work for full credit and for partial credit.

1. Given the following reaction, what is the theoretical yield of K_2CO_3 (FW = 138.21 g/mol) (in grams) if you start out with 17.3 grams of KO_2 (FW = 71.10 g/mol) and an excess of all other needed reagents. (8 pts)

$4\ KO_2 + 2\ CO_2 \rightarrow 2\ K_2CO_3 + 3\ O_2$

$17.3\ g\ KO_2 \times \frac{1\ mol\ KO_2}{71.10\ g\ KO_2} \times \frac{2\ mol\ K_2CO_3}{4\ mol\ KO_2} \times \frac{138.21\ g}{1\ mol\ K_2CO_3} = 16.8\ g\ K_2CO_3$

2 If you have a solution of molarity 3.0 M and take 75.2 mL of that solution and dilute it to a volume of 100.5 mL, what is the new molarity ? ($M_1V_1 = M_2V_2$) (6 pts)

$M_1 = 3.0\ m \quad V_1 = 75.2\ ml, \quad V_2 = 100.5\ ml \quad M_2 = ?$

$(3.0\ M)(75.2\ ml) = (M_2)(100.5\ ml)$

$M_2 = \frac{(3.0\ m)(75.2\ ml)}{(100.5\ ml)} = 2.2\ m$ of diluted soln.

3. If you have the following ionic compound, is the reagent soluble or insoluble in water. Explain your answer in a few words. (6 pts) CO_3^{-2} are usually insoluble

Rb_2CO_3 Rb is an alkali metal cation an exception so soluble

Extra Credit (2 pts) a. Given the following reactants, write out the products by filling in the blanks in the **molecular equation**. You do not need to balance the reactions in either part of this question. (1 pt)

$2\ Na_3PO_4(aq) + 3\ BaCl_2(aq) \rightarrow Ba_3(PO_4)_2(s) + 6\ NaCl(aq)$

b. complete the following **net ionic equation** for the same reaction. (1 pt)

$3\ Ba^{+2}(aq) + 2\ PO_4^{-3}(aq) \rightarrow Ba_3(PO_4)_2(s)$

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Name Key (print name) Name _____ (sign name)

Please show all work for full credit and for partial credit.

1. Given the following reaction, what is the theoretical yield of O_2 (FW = 32.00 g/mol) (in grams) if you start out with 47.2 grams of CO_2 (FW = 44.01 g/mol) and an excess of all other needed reagents. (8 pts)

$4\ KO_2 + 2\ CO_2 \rightarrow 2\ K_2CO_3 + 3\ O_2$

$47.2\ g\ CO_2 \times \frac{mol\ CO_2}{44.01\ g\ CO_2} \times \frac{3\ mol\ O_2}{2\ mol\ CO_2} \times \frac{32.00\ g}{1\ mol\ O_2} = 51.5\ g\ O_2$

2 If you have 25.2 mL of a solution of molarity 1.5 M and want to get a molarity of 0.55 M, how many mL is the newly diluted solution are you going to need ? (6 pts)

$M_1 = 1.5\ m \quad V_1 = 25.2\ ml \quad M_2 = 0.55\ m \quad V_2 = ?$

$(1.5\ m)(25.2\ ml) = (0.55\ m)(V_2)$

$V_2 = \frac{(1.5\ m)(25.2\ ml)}{(0.55\ m)} = 69\ ml$

3. If you have the following ionic compound, is the reagent soluble or insoluble in water. Explain your answer in a few words. (6 pts)

$Ba_3(PO_4)_2$ PO_4^{-3} is usually insoluble, Ba^{+2} is not an exception so insoluble

Extra Credit (2 pts) a. Given the following reactants, write out the products by filling in the blanks in the **molecular equation**. You do not need to balance the reactions in either part of this question. (1 pt)

$Ca(OH)_2\ (aq) + MgCl_2\ (aq) \rightarrow$ $Mg(OH)_2\ (s)$ + $CaCl_2\ (aq)$

b. complete the following **net ionic equation** for the same reaction. (1 pt)

$Mg^{+2}\ (aq) + 2\ OH^{-1}\ (aq) \rightarrow Mg(OH)_2\ (s)$

green

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(print name) (sign name)

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1. Given the following reaction, what is the theoretical yield of N_2 (FW = 28.02 g/mol) (in grams) if you start out with 55.2 grams of NH_3 (FW = 17.04 g/mol) and an excess of all other needed reagents. (8 pts)

4 NH_3 + 3 O_2 → 2 N_2 + 6 H_2O

2 If you weigh out 78.2 grams of $NaNO_3$ (FW = 85.01 g/mol) and make up 1.5 Liters of the solution, what is the molarity of the solution. (6 pts)

2. If you have the following ionic compound, is the reagent soluble or insoluble in water. Explain your answer in a few words. (6 pts)

PbI_2

Extra Credit (2 pts) a. Given the following reactants, write out the products by filling in the blanks for the **molecular equation**. You do not need to balance the reactions in either part of this question. (1 pt)

$AgNO_3$ (aq) + LiBr (aq) → _____ (s) + _____ (aq)

b. Complete the following **complete ionic equation** for the same reaction (1 pt)

$Ag^{+1}(aq) + NO_3^{-1}(aq) + Li^{+1}(aq) + Br^{-1}(aq)$ → _____ (s) + $Li^{+1}(aq)$ + _____ (aq)

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1. Given the following reaction, what is the theoretical yield of H_2O (FW = 18.02 g/mol) (in grams) if you start out with 98.2 grams of O_2 (FW = 32.00 g/mol) and an excess of all other needed reagents. (8 pts)

4 NH_3 + 3 O_2 → 2 N_2 + 6 H_2O

2. If you weigh out 37.8 grams of Na_2SO_4 (FW = 142.07 g/mol) and make up 0.75 Liters of the solution, what is the molarity of the solution. (6 pts)

3. If you have the following ionic compound, is the reagent soluble or insoluble in water. Explain your answer in a few words. (6 pts)

$(NH_4)_2S$

Extra Credit (2 pts) a. Given the following reactants, write out the products by filling in the blanks in the **molecular equation**. You do not need to balance the reactions in either part of this question. (1 pt)

Li_2CO_3 (aq) + $Ba(NO_3)_2$ (aq) → _____ (s) + _____ (aq)

b. Complete the following **complete ionic equation** for the same reaction (1 pt)

2 Li^+ (aq)+ CO_3^{-2} (aq) + Ba^{+2}(aq) + 2NO_3^{-1} (aq) → _____ (s) + _____ (aq) + NO_3^{-1} (aq)

Quiz IV General Chemistry I Lecture Spring 15 Dr. Hahn 20 pts 2/24 T 9:55am form A yellow quiz # _____

Name _____ (print name) Name _____ (sign name)

Please show all work for full credit and for partial credit.

1. Given the following reaction, what is the theoretical yield of K_2CO_3 (FW = 138.21 g/mol) (in grams) if you start out with 17.3 grams of KO_2 (FW = 71.10 g/mol) and an excess of all other needed reagents. (8 pts)

$4\ KO_2 + 2\ CO_2 \rightarrow 2\ K_2CO_3 + 3\ O_2$

OK.

2 If you have a solution of molarity 3.0 M and take 75.2 mL of that solution and dilute it to a volume of 100.5 mL, what is the new molarity ? ($M_1V_1 = M_2V_2$) (6 pts)

3. If you have the following ionic compound, is the reagent soluble or insoluble in water. Explain your answer in a few words. (6 pts)

Rb_2CO_3

Extra Credit (2 pts) a. Given the following reactants, write out the products by filling in the blanks in the **molecular equation**. You do not need to balance the reactions in either part of this question. (1 pt)

$Na_3PO_4(aq) + BaCl_2(aq) \rightarrow$ _____ (s) + _____ (aq)

b. complete the following **net ionic equation** for the same reaction. (1 pt)

$Ba^{+2}(aq)$ + _____ (aq) → _____ (s)

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Name _____ Name _____
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Please show all work for full credit and for partial credit.

1. Given the following reaction, what is the theoretical yield of O_2 (FW = 32.00 g/mol) (in grams) if you start out with 47.2 grams of CO_2 (FW = 44.01 g/mol) and an excess of all other needed reagents. (8 pts)

$4\ KO_2 + 2\ CO_2 \rightarrow 2\ K_2CO_3 + 3\ O_2$

2 If you have 25.2 mL of a solution of molarity 1.5 M and want to get a molarity of 0.55 M, how many mL is the newly diluted solution are you going to need ? (6 pts)

3. If you have the following ionic compound, is the reagent soluble or insoluble in water. Explain your answer in a few words. (6 pts)

$Ba_3(PO_4)_2$

Extra Credit (2 pts) a. Given the following reactants, write out the products by filling in the blanks in the **molecular equation**. You do not need to balance the reactions in either part of this question. (1 pt)

$Ca(OH)_2\,(aq) + MgCl_2\,(aq) \rightarrow$ _____ (s) + _____ aq)

b. complete the following **net ionic equation** for the same reaction. (1 pt)

_____ (aq) + $2\ OH^{-1}$ (aq) → _____ (s)