Quiz 2: Chapter 3 Dr. Hahn Greenville Tech 2/16/21 Print Name Key

Show work for all questions for partial and full credit. (25 pts total)

1. Balance the Chemical Reaction Below. Assume that the reaction goes to completion. (4 pts)

Ca S + K_3PO_4 → K_2S + $Ca_3(PO_4)_2$

$3CaS + 2K_3PO_4 \rightarrow 3K_2S + Ca_3(PO_4)_2$

3 Ca, 3 S, 6 K, 2 PO_4 | 6 K, 3 S, 3 Ca, 2 PO_4

2. What is the formula weight for the compound K_3PO_4 (3 pts)

$3(39.10) + 30.97 + 4(16.00) = 212.27$
(K, P, O)

3. a) If I have 207.8 grams of H_2O, how many moles of water do I have ? (molecular weight of H_2O is 18.02 grams / mol) (4 pts)

$207.8\ g\ H_2O \times \frac{1\ mol\ H_2O}{18.02\ g\ H_2O} = 11.53\ mol\ H_2O$

b) Out of 207.8 grams of H_2O, how many atoms of H do I have ? (avogadro's number is 6.02×10^{23}) (4 pts)

$207.8\ g\ H_2O \times \frac{1\ mol\ H_2O}{18.02\ g\ H_2O} \times \frac{2\ mol\ H}{1\ mol\ H_2O} \times \frac{6.02 \times 10^{23}\ atoms\ H}{1\ mol\ H} = 1.38 \times 10^{25}$

4. For the reaction below: (6 pts)

Fe_2O_3 (s) + 2 Al (s) → 2 Fe (l) + Al_2O_3 (s)

If I have 75.2 grams of the Fe_2O_3, what is the theoretical yield of the Fe ? Show work. (FW Fe_2O_3 = 159.7 g/mol) (FW Fe = 55.9 g/mol)

$75.2\ g\ Fe_2O_3 \times \frac{1\ mol\ Fe_2O_3}{159.7\ g\ Fe_2O_3} \times \frac{2\ mol\ Fe}{1\ mol\ Fe_2O_3} \times \frac{55.9\ g\ Fe}{1\ mol\ Fe} = 52.6\ g\ Fe$

5. Is Ca S [(soluble) or (insoluble)] (circle one) in water ? (4 pts)

CaS - exception to S^{-2} in soluble

Quiz 4: Chapter 4 Dr. Hahn Greenville Tech 2/23/21 Print Name Key

Show work for all questions for partial and full credit. (25 pts total)

1. Write out the product of the metathesis reaction below. (if get precipitate, the reaction goes to product. If do not get precipitate, the reaction does not go to product.) (12 pts)

a) Na_2CO_3 + ~~$BaCO_3$~~ → $BaCl_2$ (typo) $2NaCl$ (3 pt) + $BaCO_3(s)$ (3pt)

b) Which one of the products comes out of solution as a precipitate ? $BaCO_3$ (6 pts)

2. Which of the following are strong acids ? Circle all strong acids. (5 pts, 1 pt each)

H Br H F H_2SO_4 CH_3COOH Li OH ← strong base

weak acid

3. What is the oxidation state of the following ? (8 pts, 2 pts each)

a. F_2 Zero b. H F (ox state of F) -1 (group 7 − 8 = −1)

c. Ag Zero d. N in NO_2 $+4$ (show work) $N + 2(-2) = 0$ Zero

$N = +4$

4. In the reaction 2 H Cl + Mg → H_2 + $MgCl_2$

(more + ox)

a. The element undergoing oxidation is Mg (EC, 1 pt) $Mg(0) \rightarrow Mg^{+2}$

b. The element undergoing reduction is H (EC, 1 pt) $H^+ \rightarrow H(0) + 1e^-$

c. If the **H** is lower in the activity series than the **Mg**, does the reaction go forward as written (yes, no) (circle one) (EC, 1 pt) Mg is ox — H is reduction Mg higher

5. a. Molarity (M) of a solution made by dissolving 78.2 grams of Li Cl to make up 240.7 mL solution is 7.6 M (M = moles solute / L solution) (formula weight of Li Cl is 42.44 g/mol) (1000 mL = 1 L) (EC, 1 pt)

$$78.2\text{ g LiCl} \times \frac{1\text{ mol LiCl}}{42.44\text{ g LiCl}} = 1.84\text{ moles}$$

$$240.7\text{ mL} \times \frac{1\text{ L}}{1000\text{ mL}} = 0.2407\text{ L}$$

$$\frac{1.84}{0.2407} =$$

b. If you have 25.2 L of a Na Cl solution of molarity 1.25 M, how many moles of Na Cl do you have ? (EC, 1 pt)

$$25.2\text{ L} \times \frac{1.25\text{ mol NaCl}}{1\text{ L soln}} = 31.5\text{ mol NaCl}$$

NaCl soln