CHM1020 – Practice Test 3 Name_____
Fall 2014 (and some of what used to be on Test 4, so the points will not add up to 100%)
(Test 3 on Chapters 7, 8, & 9)

Part 1. Multiple Choice. Circle the one alternative that best completes the statement or answers the question.

1. Which of the following is soluble in water? (2 pts.)

   a) $BaSO_4$ b) AgCl c) KOH d) $Fe(OH)_3$ e) $PbSO_4$ f) $PbBr_2$

2. Which of the following is insoluble in water? (2 pts.)

   a) $Fe(NO_3)_3$ b) $BaCl_2$ c) $Ba(OH)_2$ d) $CaCO_3$ e) Li_2S f) NaBr

3. Reduction is defined as: (2 pts.)

   a) loss of electrons b) gain of electrons c) loss of H d) gain of H e) loss of O

4. Is the following an Oxidation-Reduction reaction, and if so, what element is oxidized? (2 pts.)

   $2\ KBr\ (s) \rightarrow 2\ K\ (s) + Br_2\ (g)$

   a) K b) Br c) Br_2 d) KBr e) This is not an oxidation-reduction reaction.

PART 2. FILL IN THE BLANK or Short Answer or Calculations (MUST SHOW ALL WORK with units and correct significant figures).

5. What is the mass of 0.348 moles of calcium? (3 pts.)

6. How many moles of zinc are in 43.0 g of zinc? (3 pts.)

7. How many copper atoms are in 8.79 moles of copper? (2 pts.)

8. How many copper atoms are in 34.9 g of copper? (4 pts.)

9. What is the molar mass of magnesium nitrate, $Mg(NO_3)_2$? Report answer to 5 significant figures. (4 pts.)

10. What is the mass of 0.477 moles of magnesium nitrate? (4 pts.)

11. What is the percent by mass composition of oxygen in magnesium nitrate? Report answer to 4 significant figures. (4 pts.)

12. How many moles of iron (III) chlorate, $Fe(ClO_3)_3$, are in 273 g of iron (III) chlorate? (4 pts.)

13. How many moles of carbon are in 3.28 moles of C_3H_8? (2 pts.)

14. How many carbon atoms are in 3.28 moles of C_3H_8? (4 pts.)

15. How many carbon atoms are in 47.2 g of C_3H_8? (5 pts.)

16. How many moles of O_2 react with 6.21 moles of iron? (2 pts.)

$$4\ Fe\ (s) + 3\ O_2\ (g) \rightarrow 2\ Fe_2O_3\ (s)$$

17. How many moles of Fe_2O_3 are produced when 6.21 moles of iron react? (2 pts.)

$$4\ Fe\ (s) + 3\ O_2\ (g) \rightarrow 2\ Fe_2O_3\ (s)$$

18. How many moles of Fe_2O_3 are produced when 39.7 g of iron react? (4 pts.)

$$4\ Fe\ (s) + 3\ O_2\ (g) \rightarrow 2\ Fe_2O_3\ (s)$$

19. A compound with the empirical formula CH_2 was found to have a molar mass of approximately 84 g/mole. What is the molecular formula of the compound? (5 pts.)

20. If we want to produce 73.0 g of iron (III) oxide, (a) how many moles of iron do we need to react, and (b) how many grams of iron do we need to react? (6 pts.)

$$4\ Fe\ (s) + 3\ O_2\ (g) \rightarrow 2\ Fe_2O_3\ (s)$$

21. If 15.7 g of iron reacts and 18.3 g of iron (III) oxide are produced in lab, what is the percent yield? (7 pts.)

$$4\ Fe\ (s) + 3\ O_2\ (g) \rightarrow 2\ Fe_2O_3\ (s)$$

22. What is the empirical formula of a compound that contains 82.66% carbon and 17.34% hydrogen by mass? (6 pts.)

23. For the following reaction, (a) write the balanced, complete ionic equation (5pts.), (b) write the balanced net ionic equation (3 pts.), and (c) list or circle the spectator ions (2 pts.).

$BaCl_2$ (aq) + K_2SO_4 (aq) $\rightarrow$ $BaSO_4$ (s) + 2 KCl (aq)

PART 3. Do the following reactions occur, and if so, what are the products? (If you say No Reaction, cross off any products.) [You do NOT need to balance the reactions.] (2-3 pts. each)

24.) $Ba(OH)_2$ (aq) + HBr (aq) $\rightarrow$ yes or no (circle one) $\rightarrow$ _____

25.) KCl (aq) + $Pb(NO_3)_2$ (aq) $\rightarrow$ yes or no (circle one) $\rightarrow$ _____

26.) C_3H_8 (g) + O_2 (g) $\rightarrow$ <u>yes</u> $\rightarrow$ _____

27.) NH_4Br (aq) + $LiNO_3$ (aq) $\rightarrow$ yes or no (circle one) $\rightarrow$ _____

28. If 0.322 moles of iron reacts with 0.260 moles of oxygen gas, (a) what is the limiting reactant. Must show work and explain. (b) How many moles of iron (III) oxide are produced? MUST show work. (9 pts.)

$$4\ Fe\ (s) + 3\ O_2\ (g) \rightarrow 2\ Fe_2O_3\ (s)$$