Name: _____ Chemistry Practice Test Period ____

Unit 05: Chemical Reactions and the Mole

Skill 1: Predicting Products Part 1:

Directions: Predict the following products and then balance the equations.

Nickel(III) hydroxide + calcium sulfide \rightarrow

Skill 2: Balancing Equations

Directions: Balance the following reactions.

| 1) | CH_4 + | $O_2 \rightarrow CO_2 +$ | - H ₂ O | |
|----|-----------------------------------|----------------------------|---------------------|---------------------|
| 2) | $CoCl_2$ + | кон → | KCl + | Co(OH) ₂ |
| 3) | Li + | $Al_2(SO_4)_3 \rightarrow$ | Li_2SO_4 + | Al |
| 4) | Na ₂ CO ₃ + | $Ca(NO_3)_2 \rightarrow$ | NaNO ₃ + | - CaCO ₃ |
| 5) | Fe + | $H_2O \rightarrow H_2$ | + Fe_2O_3 | |

Skill 3: Types of Reactions

Directions: Indicate the type of reaction for each equation. Do NOT use abbreviations for the words.

1) Fe + $2CuNO_3 \rightarrow Fe(NO_3)_2 +$ 2Cu 2) $2C_{12}H_{26} + 37O_2 \rightarrow 24CO_2 + 26H_2O$ **3)** $2\text{Ti}(\text{OH})_3 \rightarrow$ $Ti_2O_3 +$ $3H_2O$ **4)** 2Cu + $O_2 \rightarrow$ 2CuO **5)** 2LiF + $BaCl_2 \rightarrow$ $BaF_2 +$ 2LiCl **6)** LiOH + HNO₃ \rightarrow $H_2O + LiNO_3$ Unit 05: Practice Test

Skill 4: Predicting Products

Directions: Predict the following products and then balance the equations.

| 1) | $Li_3PO_4 + CoF_2 \rightarrow$ |
|----|--|
| 2) | $Zn + Cu(OH)_2 \rightarrow$ |
| 3) | $C_5H_{12} + O_2 \rightarrow$ |
| 4) | NaF → |
| 5) | Cu + $O_2 \rightarrow$ (copper will be a +2 ion) |

Skill 5: Molar Mass

Directions: Calculate the gram molecular or gram formula mass of the following compounds. Write your answer, using the correct number of sig. figs., in the space provided. All work must be shown for credit.

| 1) | Cu ₂ S | |
|----|----------------------------------|--|
| 2) | Na ₂ SO ₄ | |
| 3) | $C_{5}H_{10}O_{2}$ | |
| 4) | NO ₂ | |
| 5) | Li ₂ CrO ₄ | |

Skill 6: Chemical Quantities Conversions

Directions: Complete the following calculations. Write your answer in the space provided. You must use dimensional analysis to convert. All work must be shown for credit.

1) Calculate the mass of 50.1 moles of HNO₃.

2) How many moles are in 32.3 g of Li_2O ?

Final Answer_____

Final Answer_____

3) Calculate the number of atoms in 11.1 grams of gold.

Final Answer_____

4) What is the mass of 9.6 x 10^{23} molecules of C₆H₆?

Final Answer_____

5) How many Liters are in 23.2 grams of NO₂?

Final Answer_____

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Skill 7: Percent Composition

Directions: Calculate the percent composition of the following compounds. Show all of your work. **1)** FeO

 $2) NaC_2H_3O_2$

Skill 8: Mass and Mole Relationships in Chemical Formulas

Directions: Answer the following questions. Circle your final Answer. You must use dimensional analysis to convert. All work must be shown for credit.

1) A sample of $C_6H_{14}O_3$ contains 90.9 grams of $C_6H_{14}O_3$. How many moles of O are present?

2) A sample of $C_{10}H_4Cl_2O_2$ contains 0.251 moles of $C_{10}H_4Cl_2O_2$. How many grams of C are present?

3) A sample of $Na_2S_2O_5$ contains 18.3 grams of Na. How many grams of $Na_2S_2O_5$ are present?

4) A sample of $C_9H_7O_2N_a$ contains 52.1 grams of C. How many grams of H are present?

Skill 9: Empirical Formulas

Directions: Given the following data, calculate the empirical formulas for the following compounds. Show all of your work. Circle your final answer.

1) Determine the empirical formula of a compound that was found to consist of 38.67g carbon, 16.22g hydrogen, and 45.11g nitrogen.

2) Determine the empirical formula of a compound that was found to consist of 71.65% chlorine, 24.27% carbon and 4.07% hydrogen.

Skill 10: Molecular Formula

Directions: Given the following data, calculate the molecular formulas for the following compounds. Show all of your work. Circle your final answer.

1) Determine the molecular formula of a compound that was found to consist of 43.64 % phosphorus and 56.36% oxygen. The molecular mass of the compound is 283.88 g/mole.

2) Determine the molecular formula of a compound that was found to consist of 71.65g chlorine, 24.27g carbon and 4.07g hydrogen. The molecular mass of the compound is 98.96 g/mole.