

Name _____

AP Chem

____/____/____

Chapter 3
Warm-Up #3**No Calculator**

1. Aluminum reacts with sulfuric acid to form aluminum sulfate and hydrogen gas. Give the sum of all coefficients (all reactants and products) for this balanced chemical expression.

- a. 4 b. 5 c. 6 d. 9 e. 12

2. Methane reacts with oxygen to form carbon dioxide and water as shown in the following chemical equation:
 $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$. If 72 g of water form, how much methane must have reacted?

- a. 16 g b. 32 g c. 36 g d. 84 g e. 72 g

3. Hydrogen reacts with oxygen to form only water. If 16 grams of hydrogen is mixed with 16 grams of oxygen, how much water can form?

- a. 0.50 grams b. 8.0 grams c. 18 grams d. 72 grams e. 144 grams

4. Nitric acid reacts with silver metal: $4\text{HNO}_3 + 3\text{Ag} \rightarrow \text{NO} + 2\text{H}_2\text{O} + 3\text{AgNO}_3$. Calculate the number of grams of NO formed when 10.8 g of Ag reacts with 12.6 g of HNO_3 .

- a. 0.999 g b. 9.0 g c. 12.0 g d. 18.0 g e. 30.0 g

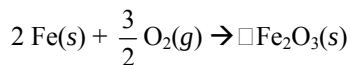
5. How many moles of molecules of diacetylmorphine, $\text{C}_{21}\text{H}_{23}\text{NO}_5$, are there in 738.8 grams of this substance?

- a. 2.00 mole of molecules b. 21.0 mole of molecules c. 1.20×10^{23} mole of molecules
d. 6.02×10^{23} mole of molecules e. 3.01×10^{23} mole of molecules

Calculator Allowed.

6. A 10.0 gram sample of an oxide of copper is heated in a stream of pure hydrogen, forming 1.26 grams of water.

- (a) Determine the percentage of copper in the compound.
(b) Determine the empirical formula of the copper oxide.
(c) Name the compound.



7. Iron reacts with oxygen to produce iron(III) oxide, as represented by the equation above. A 75.0 g sample of Fe(s) is mixed with 11.5 L of $\text{O}_2\text{(g)}$ at STP.

(a) Calculate the number of moles of each of the following before the reaction begins.

- (i) Fe(s)
(ii) $\text{O}_2\text{(g)}$

(b) Identify the limiting reactant when the mixture is heated to produce $\text{Fe}_2\text{O}_3\text{(s)}$. Support your answer with calculations.

(c) Calculate the number of moles of $\text{Fe}_2\text{O}_3\text{(s)}$ produced when the reaction proceeds to completion.