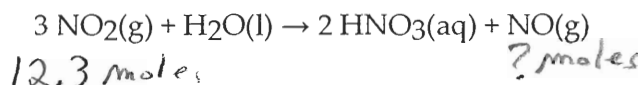


SHOW ALL WORK TO RECEIVE CREDIT

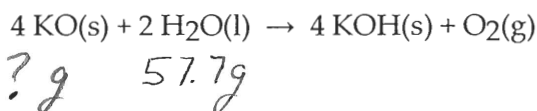
Atomic masses: H 1.008; C 12.01; N 14.01; O 16.00; K 39.01

1. (6 Pts) According to the following balanced reaction, how many moles of NO are formed from 12.3 moles of NO₂ if there is plenty of water present?



$$\frac{12.3 \text{ moles NO}_2}{3 \text{ moles NO}_2} \times \frac{1 \text{ mole NO}}{3 \text{ moles NO}_2} = 4.10 \text{ mol NO}$$

2. (8 Pts) According to the following balanced reaction, how many grams of KO are required to exactly react with 57.7 grams of H₂O?

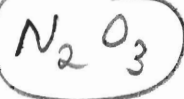


$$\frac{57.7 \text{ g H}_2\text{O}}{18.02 \text{ g H}_2\text{O}} \times \frac{4 \text{ mol KO}}{2 \text{ mol H}_2\text{O}} \times \frac{55.01 \text{ g KO}}{1 \text{ mol KO}} = 352.3 \text{ g KO}$$

3. (6 Pts) Determine the empirical formula for a compound that is 36.86% N and 63.14% O by mass.

Assume 100g

$$\text{N: } \frac{36.86 \text{ g}}{14.01 \text{ g/mol}} = 2.631 \div 2.631 \approx 1 \times 2 \approx 2$$



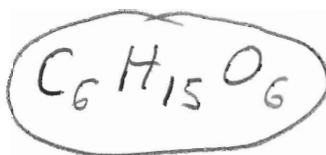
$$\text{O: } \frac{63.14 \text{ g}}{16.00 \text{ g/mol}} = 3.946 \div 2.631 \approx 1.5 \times 2 \approx 3$$

4. (5 Pts) A compound has an empirical formula of C₂H₅O₂ and a molar mass of 182.3 g/mol. Determine its molecular formula.

Divide the molar mass by the empirical mass and use # as multiplier

$$\text{C}_2\text{H}_5\text{O}_2 \text{ mass} = 61.06$$

$$182.3 \div 61.06 \approx 3$$

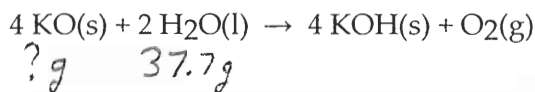


CHM151 Quiz 3b 25 Pts Spring 2010 Name: Key

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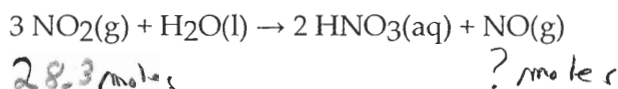
Atomic masses: H 1.008; C 12.01; N 14.01; O 16.00; K 39.01

1. (8 Pts) According to the following balanced reaction, how many grams of KO are required to exactly react with 37.7 grams of H₂O?



$$\frac{37.7 \text{ g H}_2\text{O}}{18.02 \text{ g H}_2\text{O}} \times \frac{2 \text{ mol H}_2\text{O}}{2 \text{ mol H}_2\text{O}} \times \frac{4 \text{ mol KO}}{2 \text{ mol H}_2\text{O}} \times \frac{55.01 \text{ g KO}}{1 \text{ mol KO}} = 230.2 \text{ g KO}$$

2. (6 Pts) According to the following balanced reaction, how many moles of NO are formed from 28.3 moles of NO₂ if there is plenty of water present?



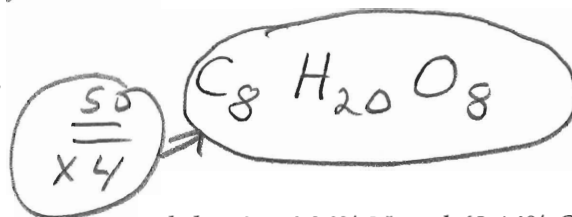
$$\frac{28.3 \text{ mole NO}_2}{3 \text{ mole NO}_2} \times \frac{1 \text{ mole NO}}{3 \text{ mole NO}_2} = 9.43 \text{ mole NO}$$

3. (5 Pts) A compound has an empirical formula of C₂H₅O₂ and a molar mass of 243.1 g/mol. Determine its molecular formula.

Divide the molar mass by the empirical mass and use # as multiplier.

$$\text{C}_2\text{H}_5\text{O}_2 \text{ mass} = 61.06$$

$$243.1 \div 61.06 = 4$$



4. (6 Pts) Determine the empirical formula for a compound that is 36.86% N and 63.14% O by mass.

Assume 100g

$$\text{N: } \frac{36.86 \text{ g}}{14.01 \text{ g/mol}} = 2.631 \div 2.631 = 1 \times 2 = 2$$

$$\text{O: } \frac{63.14 \text{ g}}{16.00 \text{ g/mol}} = 3.946 \div 2.631 = 1.5 \times 2 = 3$$

