Chemistry 1 Evaluation A– Stoichiometry Name Teal

Block_____ Date_____

For the following problems, SHOW ALL WORK.

1. Given the reaction,

$$2H_{2(g)} + O_{2(g)} \rightarrow 2H_2O_{(g)}$$

to produce 0.800 moles of $H_2O_{(g)}$,

a.) how many moles of H_2 are needed?

1 : 1

0.800 mole H_2

b.) how many liters of O_2 are needed?

2 : 1 ⇒ 0.400 mole O_2

$$\frac{22.4\ L}{1\ mole} = \frac{X\ L}{0.400\ mol}$$

8.96 L O_2

c.) how many molecules of O_2 are needed?

(0.400 mole)(6.022 × 10^{23}) = 2.4 × 10^{23} molecules O_2

2. Given the reaction

$$4\ NH_{3(g)} + 5\ O_{2(g)} \rightarrow 4NO_{(g)} + 6\ H_2O_{(g)}$$

how many grams of NH_3 will be required to react with 63g of O_2?

$\frac{63g}{32g/mole} = 1.97 mole\ O_2$

$\frac{4 mol\ NH_3}{5\ O_2} = \frac{X mol\ NH_3}{1.97\ O_2}$ $X = 1.58 mole\ NH_3$

$(1.58\ NH_3)(17g/mole)$ $27g\ NH_3$

3. Given the following reaction

$$2\ C_4H_{10(g)} + 13\ O_{2(g)} \rightarrow 8CO_{2(g)} + 10\ H_2O_{(g)}$$

determine the number of liters of carbon dioxide produced when 36.0 liters of oxygen gas is used.

$\frac{8\ CO_2}{13\ O_2} = \frac{X\ CO_2}{36.0\ O_2}$ $22L\ CO_2$