Worksheet 1

Stoichiometry

Mole to Mole Ratio

Name:

Gr/Sec:

Sample Problem:

Equation: $N_2 + 3H_2 \rightarrow 2NH_3$

Problem: If we have 2.00 mol of N_2 reacting with sufficient H2, how many moles of NH_3 will be produced?

Solving the Problem:

(a) Balance the equation (the equation is already balanced).

(b) The ratio from the problem that you will have to deal with is the ratio of N_2 and NH_3 .

You will be having **1 mol N_2 : 2 mol NH_3** as observed from the given equation.

(c) What is being asked in the problem is the number of **mol NH_3** that you will be deriving from the given **2 mol N_2**.

(d) Start the conversion factor.

$$2 \text{ mol } N_2 \times \frac{2 \text{ mol } NH_3}{1 \text{ mol } N_2} = 4 \text{ mol } NH_3$$

= 4 moles of NH_3 will be produced.

Try to answer this ff sample problems.

1. Equation: $C_3H_8 + O_2 \rightarrow CO_2 + H_2$

(a) Write the correct balanced equation.

(b) How many moles of O_2 are required to combust with 3.5 moles of C_3H_8?

(c) How many moles of CO_2 are produced if 4.12 moles of O_2 is reacted with C_3H_8?

(d) How many moles of H_2 are produced if 2 moles of C_3H_8?

Answer to **(a)** :

$__C_3H_8 + __O_2 \rightarrow __CO_2 + __H_2$

Solution/Answer to **(b)**:

$$\square \times \frac{\square}{\square} = \square$$

Solution/Answer to **(c)**:

$$\square \times \frac{\square}{\square} = \square$$

Solution/Answer to **(d)**:

$$\square \times \frac{\square}{\square} = \square$$

2. Carbon disulfide is an important industrial solvent. It is prepared by the reaction of carbon (called coke) with sulfur dioxide:

$$C + SO_2 \rightarrow CS_2 + CO$$

(a) Balance the equation.

(b) How many moles of carbon are needed to react with 3.01 mol SO_2?

(c) How many moles of carbon monoxide form at the same time that 0.45 mol SO_2 reacts with C?

(d) How many moles of SO_2 are required to make 125 mol CS_2?

Answer to **(a)** :

$$__C + __SO_2 \rightarrow __CS_2 + __CO$$

Solution/Answer to **(b)**:

$$\square \times \frac{\square}{\square} = \square$$

Solution/Answer to **(c)**:

$$\square \times \frac{\square}{\square} = \square$$

Solution/Answer to **(d)**:

$$\square \times \frac{\square}{\square} = \square$$