Mole Ratio Worksheet

1) Given this equation: $N_2 + 3 H_2 \longrightarrow 2 NH_3$, write the following molar ratios:

    a) N_2 / H_2

    b) N_2 / NH_3

    c) H_2 / NH_3

2) Given the following equation: $8 H_2 + S_8 \longrightarrow 8 H_2S$, write the following molar ratios:

    a) H_2 / H_2S

    b) H_2 / S_8

    c) H_2S / S_8

3) Answer the following questions for this equation: $2 H_2 + O_2 \longrightarrow 2 H_2O$

    a) What is the H_2 / H_2O molar ratio?

    b) Suppose you had 20 moles of H_2 on hand and plenty of O_2, how many moles of H_2O could you make?

    c) What is the O_2 / H_2O molar ratio?

    d) Suppose you had 20 moles of O_2 and enough H_2, how many moles of H_2O could you make?

4) Use this equation: $N_2 + 3 H_2 \longrightarrow 2 NH_3$, for the following problems

    a) If you used 1 mole of N_2, how many moles of NH_3 could be produced?

    b) If 10 moles of NH_3 were produced, how many moles of N_2 would be required?

    c) If 3.00 moles of H_2 were used, how many moles of NH_3 would be made?

    d) If 0.600 moles of NH_3 were produced, how many moles of H_2 are required?
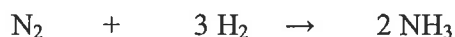
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1. Consider the chemical reaction represented by the equation below:

$$3 \text{ MgCl}_2 \quad + \quad 2 \text{ Al} \quad \rightarrow \quad 3 \text{ Mg} \quad + \quad 2 \text{ AlCl}_3$$

   a. If 8 moles of magnesium chloride react with enough aluminum, how many moles of aluminum chloride are produced?

   b. How many moles of magnesium chloride are needed to with 10 moles of aluminum?

2. Consider the following chemical reaction:

$$\text{N}_2 \quad + \quad 3 \text{ H}_2 \quad \rightarrow \quad 2 \text{ NH}_3$$

   a. How many moles of nitrogen gas are needed to react with to react with 7.5 moles of hydrogen?

   b. How many moles of ammonia would you get if 4.5 moles of hydrogen gas reacted?

   c. How many moles of nitrogen gas are needed in order to produce 5 moles of NH_3?

3. Consider the combustion of methane (CH_4).

   a. How many moles of carbon dioxide are obtained when 20 moles of methane are burned?

   b. If only 15 moles of oxygen are available, how many moles of methane will burn?

   c. During combustion, 12 moles of carbon dioxide were obtained. How many moles of water were also obtained?