

Stoichiometry

Name - _____



a.) How many oxygen molecules react with 6 molecules of C_2H_6 ?

Answer - $6 \text{ molec C}_2\text{H}_6 \times \frac{7 \text{ molec O}_2}{2 \text{ molec C}_2\text{H}_6} = 21 \text{ molec O}_2$

b.) How many H_2O molecules are produced when 12 molecules of C_2H_6 react?

Answer - $12 \text{ molec C}_2\text{H}_6 \times \frac{6 \text{ molec H}_2\text{O}}{2 \text{ molec C}_2\text{H}_6} = 36 \text{ molec H}_2\text{O}$

c.) How many moles of oxygen molecules are needed to produce 18 moles of CO_2 ?

Answer - $18 \text{ mol CO}_2 \times \frac{7 \text{ mol O}_2}{4 \text{ mol CO}_2} = 31.5 = 32 \text{ mol O}_2$

d.) How many moles of CO_2 are produced when 13 moles of C_2H_6 are used up?

Answer - $13 \text{ mol C}_2\text{H}_6 \times \frac{4 \text{ mol CO}_2}{2 \text{ mol C}_2\text{H}_6} = 26 \text{ mol CO}_2$



a.) How many molecules of Fe_3O_4 are produced when 12 atoms of Fe react?

Answer - $12 \text{ atoms Fe} \times \frac{1 \text{ molec Fe}_3\text{O}_4}{3 \text{ atoms Fe}} = 4 \text{ molec Fe}_3\text{O}_4$

b.) How many moles of Fe are required to produce 16 moles of H_2 ?

Answer - $16 \text{ mol H}_2 \times \frac{3 \text{ mol Fe}}{4 \text{ mol H}_2} = 12 \text{ mol Fe}$

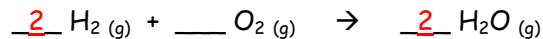
c.) How many H_2 molecules are made when 40 molecules of Fe_3O_4 are produced?

Answer - $40 \text{ molec Fe}_3\text{O}_4 \times \frac{4 \text{ molec H}_2}{1 \text{ molec Fe}_3\text{O}_4} = 160 \text{ molec H}_2$

d.) How many moles of H_2O are required to react with 14.5 moles of Fe?

Answer - $14.5 \text{ mol Fe} \times \frac{4 \text{ mol H}_2\text{O}}{3 \text{ mol Fe}} = 19.3 \text{ mol H}_2\text{O}$

3.) How many moles of H₂O are produced when 9.6 moles of O₂ (g) react according to the equation



Answer - $9.6 \text{ mol O}_2 \times \frac{2 \text{ mol H}_2\text{O}}{1 \text{ mol O}_2} = 19.2 \text{ mol} = 19 \text{ mol H}_2\text{O}$

4.) Consider the equation $\underline{3} \text{ I}_2 \text{ (g)} + \underline{6} \text{ F}_2 \text{ (g)} \rightarrow \underline{2} \text{ IF}_5 \text{ (g)} + \underline{\quad} \text{ I}_4\text{F}_2 \text{ (g)}$

a.) How many moles of I₄F₂ (g) are produced by 5.40 moles of F₂ (g)?

Answer - $5.40 \text{ mol F}_2 \times \frac{1 \text{ mol I}_4\text{F}_2}{6 \text{ mol F}_2} = 0.900 \text{ mol I}_4\text{F}_2$

b.) How many moles of F₂ (g) are required to produce 4.50 moles of IF₅ (g)?

Answer - $4.50 \text{ mol IF}_5 \times \frac{6 \text{ mol F}_2}{2 \text{ mol IF}_5} = 13.5 \text{ mol F}_2$

c.) How many moles of I₂ (g) are required to react with 7.60 moles of F₂ (g)?

Answer - $7.60 \text{ mol F}_2 \times \frac{3 \text{ mol I}_2}{6 \text{ mol F}_2} = 3.80 \text{ mol I}_2$

5.) A student decomposes some hydrogen peroxide, H₂O₂, according to the following reaction



If a total of 0.125 moles of reactants and products are involved in the reaction, how many moles of O₂ are produced?

Answer - $0.125 \text{ mol all} \times \frac{1 \text{ mol O}_2}{5 \text{ mol all}} = 0.025 \text{ mol O}_2$