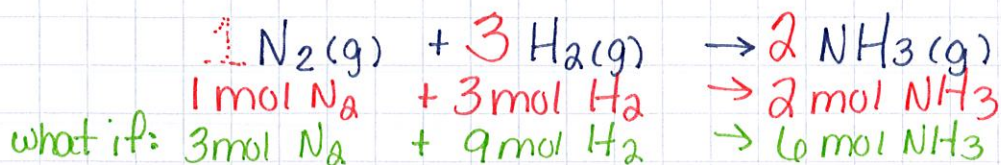


Stoichiometry

the relationship between the relative amounts of reactants and products taking part in a chemical reaction.

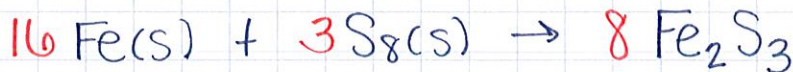
uses a concept called a MOLE RATIO - comes from the balanced equation.

Balance the equation:



$$\frac{\text{mole ratio}}{\frac{\text{mol unknown}}{\text{mol given}}} \leftarrow \text{from the balanced equation.}$$

Ex)



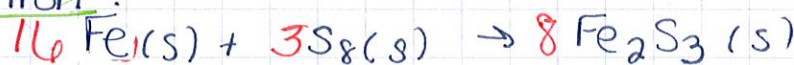
How many moles of iron(III) sulfide are formed from the reaction of 6.52 moles S₈ with excess iron?
GIVEN

$$\frac{6.52 \text{ mol S}_8}{3 \text{ mol S}_8} \times \frac{8 \text{ mol Fe}_2\text{S}_3}{8 \text{ mol Fe}_2\text{S}_3} =$$

$$17.4 \text{ mol Fe}_2\text{S}_3$$

Ex)

How many moles of sulfur are needed to completely react with 0.0286 mol of iron?



$$\frac{0.0286 \text{ mol Fe}}{11 \text{ mol Fe}} \times \frac{3 \text{ mol S}_8}{8 \text{ mol Fe}_2\text{S}_3} = 0.00536 \text{ mol S}_8$$



How many moles of steam are produced from the reaction of 99.99 g of propane (C₃H₈) with excess oxygen?
GIVEN

$$\frac{99.99 \text{ g C}_3\text{H}_8}{44.11 \text{ g C}_3\text{H}_8} \times \frac{1 \text{ mol C}_3\text{H}_8}{1 \text{ mol C}_3\text{H}_8} \times \frac{4 \text{ mol H}_2\text{O}}{1 \text{ mol C}_3\text{H}_8} = 9.067 \text{ mol H}_2\text{O}$$

$$\begin{array}{l} \text{C } 3 \times 12.01 \text{ g} = 36.03 \text{ g} \\ \text{H } 8 \times 1.01 \text{ g} = 8.08 \text{ g} \\ \hline 44.11 \text{ g} \end{array}$$



How many moles of water are made from decomposition of .00987 g of hydrogen peroxide?
GIVEN

$$\frac{.00987 \text{ g H}_2\text{O}_2}{34.02 \text{ g H}_2\text{O}_2} \times \frac{1 \text{ mol H}_2\text{O}_2}{1 \text{ mol H}_2\text{O}_2} \times \frac{2 \text{ mol H}_2\text{O}}{2 \text{ mol H}_2\text{O}_2} = .000290 \text{ mol H}_2\text{O}$$