

1. The reaction for the combustion of methane is:

$\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$; If **4.0 moles of CH₄** are burned, how many **oxygen atoms** are required? (Hint: Avagadro number)

2. Aluminum reacts with oxygen to form aluminum oxide:

$4\text{Al} + 3\text{O}_2 \rightarrow 2\text{Al}_2\text{O}_3$, How many **oxygen atoms** are in 102 g of Al_2O_3 ? Molar mass of $\text{Al}_2\text{O}_3 = 102\text{g/mol}$

3. The reaction between iron and sulfur produces iron (II) sulfide:

$\text{Fe} + \text{S} \rightarrow \text{FeS}$, If 3.50 moles of **Fe** react with 2.00 moles of **S**, A. Determine the limiting reactant.
B. Calculate the mass of FeS produced. (Molar mass of FeS = 87.91 g/mol)