

### Assignment

1. How many moles of methane are required to produce 22 g  $\text{CO}_2$  (g) after combustion?

Ans) GMM of  $\text{CO}_2 = 12 + (16 \times 2) = 44 \text{ g}$

$$\therefore 22 \text{ g of } \text{CO}_2 = \frac{1}{44} \times 22$$
$$= \underline{\underline{0.5 \text{ mol}}}$$

2. Determine the empirical formula of an oxide of iron which has 69.9% iron and 30.1% dioxygen by mass.

Ans)

Element	%	At. mass	Relative no. of atoms	Simplest atomic ratio	Simplest whole number ratio
Fe	69.9	56	$\frac{69.9}{56} = 1.25$	$\frac{1.25}{1.25} = 1 \times 2$	2
O	30.1	16	$\frac{30.1}{16} = 1.88$	$\frac{1.88}{1.25} = 1.5 \times 2$	3

Empirical formula =  $\text{Fe}_2\text{O}_3$