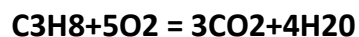


**Question:** How many molecules of carbon dioxide will be formed if 4.98 g of propane is burned in the following reaction?



**Answer:** First we must make a proportion



44g/mol - 3 mol

4.98g - X mol , from the following proportion we can calculate amount of

substance  $\text{CO}_2$   $\frac{4.98g \text{ C}_3 \text{ H}_8}{44g \text{ C}_3 \text{ H}_8} = \frac{X \text{ mol CO}_2}{3 * 1 \text{ mol CO}_2}$ ; find out X

$$X = \frac{4.98g \text{ C}_3 \text{ H}_8 * 3 * 1 \text{ mol CO}_2}{44g \text{ C}_3 \text{ H}_8} = 0.34 \text{ mol CO}_2 ; X = n_{\text{CO}_2} - \text{amount of substance CO}_2;$$

then find out how many molecules (N) is formed, using Avogadro constant

$$N_A = 6.02214129 \times 10^{23} \text{ mol}^{-1}; N_{\text{CO}_2} = n_{\text{CO}_2} * N_A;$$

$$N = 6.02214129 \times 10^{23} \text{ mol}^{-1} * 0.34 \text{ mol} = 2.05 \times 10^{23} \text{ molecules of CO}_2$$

**Final answer:**  $2.05 \times 10^{23}$  molecules of  $\text{CO}_2$