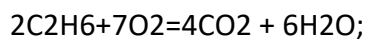


Answer on Question #79224 - Chemistry - Physical Chemistry

Question:

A mixture containing 7.0 cm³ of ethane and 5.0 cm³ of propane is burnt in excess oxygen. Find the mass of CO₂ and H₂O produced;

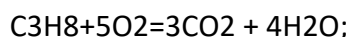
Solution:



$$n(\text{CO}_2) = V/V_m = 7/(22.4 \cdot 1000) = 0.0003 \text{ mol};$$

$$n_1(\text{CO}_2) = 2n(\text{C}_2\text{H}_6) = 0.0006 \text{ mol};$$

$$n_1(\text{H}_2\text{O}) = 3n(\text{C}_2\text{H}_6) = 0.0009 \text{ mol};$$



$$n(\text{CO}_2) = V/V_m = 5/(22.4 \cdot 1000) = 0.0002 \text{ mol};$$

$$n_2(\text{CO}_2) = 3n_2(\text{C}_2\text{H}_6) = 0.0006 \text{ mol};$$

$$n_2(\text{H}_2\text{O}) = 4n_2(\text{C}_2\text{H}_6) = 0.0008 \text{ mol};$$

$$n(\text{CO}_2) = n_1(\text{CO}_2) + n_2(\text{CO}_2) = 0.0006 + 0.0006 = 0.0012 \text{ mol};$$

$$n(\text{H}_2\text{O}) = n_1(\text{H}_2\text{O}) + n_2(\text{H}_2\text{O}) = 0.0009 + 0.0008 = 0.0017 \text{ mol};$$

$$m(\text{CO}_2) = n \cdot M = 0.0012 \cdot 44 = 0.0528 \text{ g};$$

$$m(\text{H}_2\text{O}) = n \cdot M = 0.0017 \cdot 18 = 0.0306 \text{ g}.$$

Answer: $m(\text{CO}_2) = 0.0528 \text{ g};$

$$m(\text{H}_2\text{O}) = 0.0306 \text{ g}.$$