

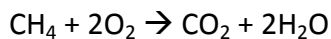
Question #81812, Chemistry, Other

Question:

What mass of carbon dioxide is produced from the complete combustion of 3.10×10^{-3} g of methane?

Solution:

Complete methane combustion can be described by the following equation:



From the equation, amount of CH_4 equals the amount of carbon dioxide.

Number of moles (CH_4 and CO_2) equals:

$$v(\text{CH}_4) = v(\text{CO}_2) = \frac{m(\text{CH}_4)}{Mr(\text{CH}_4)} = \frac{3.10 \times 10^{-3} \text{g}}{16 \text{g/mol}} = 19.4 \times 10^{-5} \text{mol}$$

Next, the mass of carbon dioxide produced from the complete combustion of methane equals:

$$m(\text{CO}_2) = v(\text{CO}_2) \times Mr(\text{CO}_2) = 19.4 \times 10^{-5} \text{mol} \times 44 \text{g/mol} = 8.54 \times 10^{-3} \text{g}$$

Answer:

Mass of carbon dioxide is **8.54×10^{-3} g**