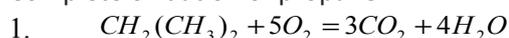


How many grams of propane can be burned by 24g of  $O_2$  ?

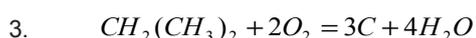
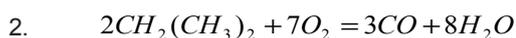
Solution:

Propane burning can occur as follows:

Complete oxidation of propane



Partial oxidation of propane



Find number of moles of oxygen

$$n(O_2) = m(O_2) / M(O_2)$$

$$n(O_2) = 24g / 32g \cdot mol^{-1} = 0.75mol$$

Find number of moles of propane ( $n_1, n_2, n_3$ ) for each reaction equation

$$n_1(CH_2(CH_3)_2) = n(O_2) / 5$$

$$n_1(CH_2(CH_3)_2) = 0.75mol / 5 = 0.15mol$$

$$n_2(CH_2(CH_3)_2) = n(O_2) / 3.5$$

$$n_2(CH_2(CH_3)_2) = 0.75mol / 3.5 = 0.214mol$$

$$n_3(CH_2(CH_3)_2) = n(O_2) / 2$$

$$n_3(CH_2(CH_3)_2) = 0.75mol / 2 = 0.375mol$$

Find weight of propane for each reaction equation

$$m_1(CH_2(CH_3)_2) = n_1(CH_2(CH_3)_2) * M(CH_2(CH_3)_2)$$

$$m_1(CH_2(CH_3)_2) = 0.15mol * 44g \cdot mol^{-1} = 6.6g$$

$$m_2(CH_2(CH_3)_2) = n_2(CH_2(CH_3)_2) * M(CH_2(CH_3)_2)$$

$$m_2(CH_2(CH_3)_2) = 0.214mol * 44g \cdot mol^{-1} = 9.416g$$

$$m_3(CH_2(CH_3)_2) = n_3(CH_2(CH_3)_2) * M(CH_2(CH_3)_2)$$

$$m_3(CH_2(CH_3)_2) = 0.375mol * 44g \cdot mol^{-1} = 16.5g$$

**Answer:** In 24 g of oxygen during the partial oxidation 16.5 g of propane can be burnt.