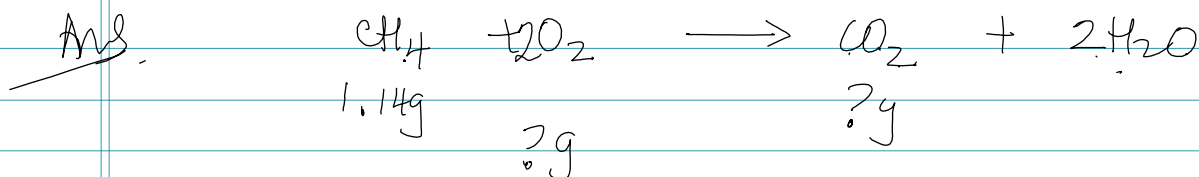


## Stoichiometry ①

① Natural gas, methane ( $\text{CH}_4$ ) burns in oxygen to give water and carbon dioxide -

- \* ④ How many grams of  $\text{CO}_2$  will be released from 1.14g  $\text{CH}_4$ ?
- \* ⑤ How much oxygen is required to combust 1.14g  $\text{CH}_4$ ?



④ Strategy:  $\text{g CH}_4 \longrightarrow \text{mol CH}_4 \longrightarrow \text{mol CO}_2 \longrightarrow \text{g CO}_2$   
(1C+4H) (1C+2(O))

$$1.14\text{g} \times \frac{1 \text{ mol CH}_4}{16.04 \text{ g CH}_4} \times \frac{1 \text{ mol CO}_2}{1 \text{ mol CH}_4} \times \frac{44.01 \text{ g CO}_2}{1 \text{ mol CO}_2} = \boxed{3.11 \text{ g CO}_2}$$

(from balanced eq.)

⑤ Strategy:  $\text{g CH}_4 \longrightarrow \text{mol CH}_4 \longrightarrow \text{mol O}_2 \longrightarrow \text{g O}_2$

$$1.14\text{g} \times \frac{1 \text{ mol CH}_4}{16.04 \text{ g CH}_4} \times \frac{2 \text{ mol O}_2}{1 \text{ mol CH}_4} \times \frac{32.00 \text{ g O}_2}{1 \text{ mol O}_2} = \boxed{4.55 \text{ g O}_2}$$

② When sodium hydrogen carbonate is heated to  $270^\circ\text{C}$ , it decomposes to give sodium carbonate, water and carbon dioxide. How much water is produced from decomposing 25.0g sodium hydrogen carbonate?

