

a) What is the limiting reagent? O_2

$$\frac{3.25 \text{ g } \cancel{\text{NH}_3}}{17.03 \text{ g } \cancel{\text{NH}_3}} \times 1 \text{ mol} = 0.19 \text{ mol } \text{NH}_3$$

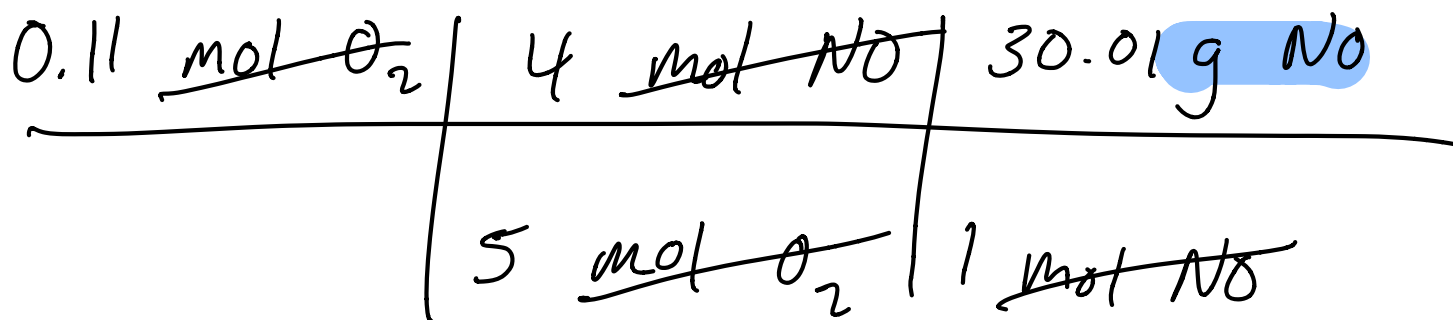
$$\frac{3.50 \text{ g } \cancel{\text{O}_2}}{32 \text{ g } \cancel{\text{O}_2}} \times 1 \text{ mol} = 0.11 \text{ mol } \text{O}_2$$

$$\frac{\text{NH}_3}{\text{O}_2} = \frac{4}{5} = 0.8 \qquad \frac{\text{O}_2}{\text{NH}_3} = \frac{5}{4} = 1.25$$

$$\frac{0.19}{0.11} = 1.7$$

$$\frac{0.11}{0.19} = 0.57$$

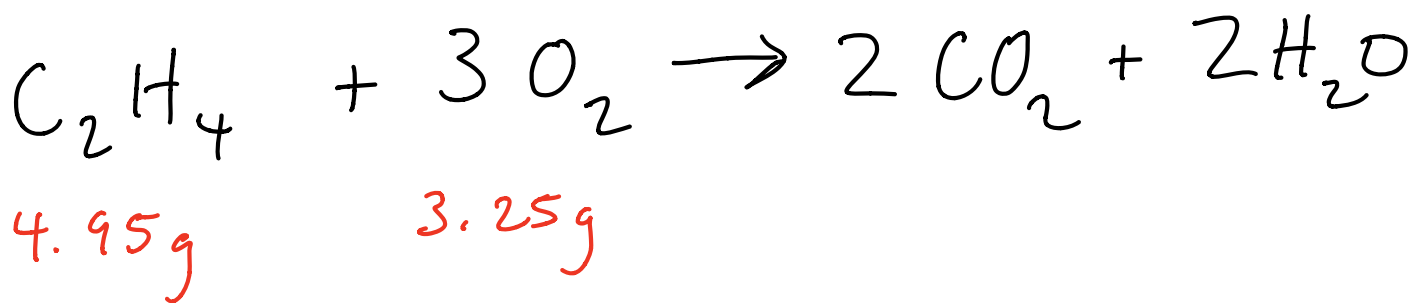
b) How many grams of NO are formed?



= 2.64 g NO formed

If 4.95 g of ethylene (C_2H_4) are combusted with 3.25 g of oxygen...

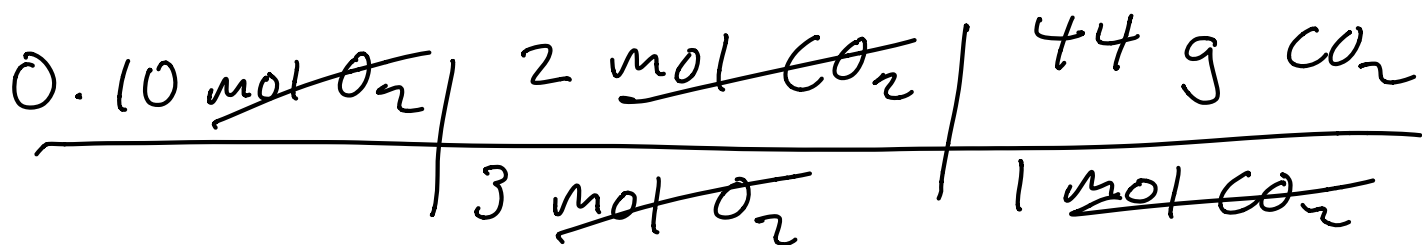
a) What is the limiting reagent? O_2



$$\frac{4.95g \cancel{C_2H_4}}{28g \cancel{C_2H_4}} \left| \frac{1 \text{ mol } C_2H_4}{1} \right. = 0.18 \text{ mol } C_2H_4$$

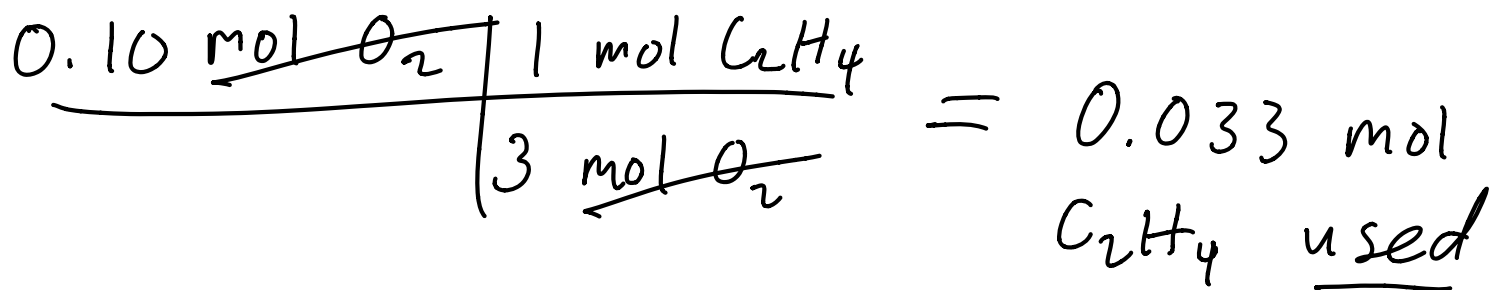
$$\frac{3.25g \cancel{O_2}}{32g \cancel{O_2}} \left| \frac{1 \text{ mol}}{1} \right. = 0.10 \text{ mol } O_2$$

b) How many grams of CO_2 are formed?



$$= 2.93 \text{ g } \text{CO}_2$$

c) How many grams of the excess reagent remain at the end of the reaction?



$$\begin{aligned} & \text{mols } C_2H_4_i - \text{mols } C_2H_4_u \\ & 0.18 \text{ mols} - 0.033 \text{ mols} \\ & = 0.147 \text{ mols unused} \end{aligned}$$

$$\frac{0.147 \text{ mols } C_2H_4}{1 \text{ mol } C_2H_4} \times \frac{28 \text{ g } C_2H_4}{1 \text{ mol } C_2H_4} = 4.12 \text{ g } C_2H_4$$