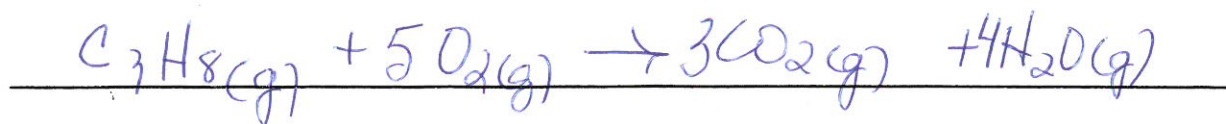


When Propane Burns in Air

burning + O₂(g)! Δ ^{fire}

1. Write the balanced chemical equation for the combustion of propane gas, C₃H₈, in a BBQ.



2. If you want to burn 0.60 moles of propane, how many moles of oxygen will you require?

1st step $0.60 \text{ mol } C_3H_8 \times \frac{5 \text{ mol } O_2}{1 \text{ mol } C_3H_8} = 3 \text{ mol } O_2$

3. If your BBQ pumps out 10.5 moles of carbon dioxide gas, what mass of propane did you burn?

2nd step $10.5 \text{ mol } CO_2 \times \frac{1 \text{ mol } C_3H_8}{3 \text{ mol } CO_2} \times \frac{44 \text{ g } C_3H_8}{1 \text{ mol } C_3H_8} = 154 \text{ g } C_3H_8$

Handwritten notes: 44g/mol, 12x3=36=8, 1x8=8

4. If you produce 46 g of water vapour, how many moles of oxygen did you use?

2nd step $46 \text{ g } H_2O \times \frac{1 \text{ mol } H_2O}{18 \text{ g } H_2O} \times \frac{5 \text{ mol } O_2}{4 \text{ mol } H_2O} = 3.2 \text{ mol } O_2$

Handwritten notes: 1x2=2, 18g/mol

5. If you burn 50. g of propane, how many grams of water vapour will you produce?

3rd step $50 \text{ g } C_3H_8 \times \frac{1 \text{ mol } C_3H_8}{44 \text{ g } C_3H_8} \times \frac{4 \text{ mol } H_2O}{1 \text{ mol } C_3H_8} \times \frac{18 \text{ g } H_2O}{1 \text{ mol } H_2O} = 81.82 \text{ g } H_2O$

6. If 66.0 g of oxygen react, what mass of carbon dioxide will form?

3rd step $66.0 \text{ g } O_2 \times \frac{1 \text{ mol } O_2}{32 \text{ g } O_2} \times \frac{3 \text{ mol } CO_2}{5 \text{ mol } O_2} \times \frac{44 \text{ g } CO_2}{1 \text{ mol } CO_2} = 54.5 \text{ g } CO_2$

7. If 54 g of water vapour is produced, how many molecules of oxygen reacted?

3rd step $54 \text{ g } H_2O \times \frac{1 \text{ mol } H_2O}{18 \text{ g } H_2O} \times \frac{5 \text{ mol } O_2}{4 \text{ mol } H_2O} \times 6.02 \times 10^{23} \text{ molecules } O_2 = 2.26 \times 10^{24} \text{ molecules } O_2$