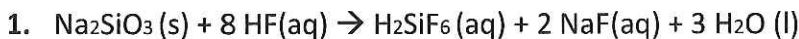
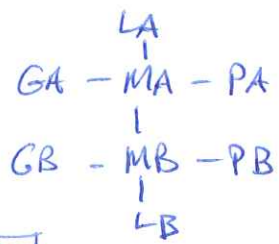


## Stoichiometry Practice



a. How many moles of HF are needed to react with 0.300 mol of  $\text{Na}_2\text{SiO}_3$ ?

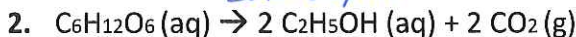
(x mole Ratio)  $0.300 \text{ mol Na}_2\text{SiO}_3 \times \frac{8 \text{ mol HF}}{1 \text{ mol Na}_2\text{SiO}_3} = \boxed{2.40 \text{ mol HF}}$

b. How many grams of NaF form when 0.500 mol of HF reacts with excess  $\text{Na}_2\text{SiO}_3$ ?

(x mole Ratio x FM)  $0.500 \text{ mol HF} \times \frac{2 \text{ mol NaF}}{8 \text{ mol HF}} = 0.125 \text{ mol NaF} \times \frac{41.99 \text{ g}}{\text{mol}} = \boxed{5.25 \text{ g NaF}}$

c. How many grams of  $\text{Na}_2\text{SiO}_3$  can react with 0.800 g of HF?

( $\frac{1}{2}$  FM x mol Ratio x FM)  $\frac{0.800 \text{ g HF}}{20.008 \text{ g/mol}} = 0.0399 \text{ mol HF} \times \frac{1 \text{ mol Na}_2\text{SiO}_3}{8 \text{ mol HF}} = 0.00499 \text{ mol Na}_2\text{SiO}_3 \times 122.07 \frac{\text{g}}{\text{mol}} = \boxed{0.610 \text{ g Na}_2\text{SiO}_3}$



a. How many moles of  $\text{CO}_2$  are produced when 0.400 mol of  $\text{C}_6\text{H}_{12}\text{O}_6$  reacts in this fashion?

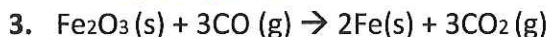
(.400 mol  $\text{C}_6\text{H}_{12}\text{O}_6$  x mole Ratio)  $0.400 \text{ mol C}_6\text{H}_{12}\text{O}_6 \times \frac{2 \text{ mol CO}_2}{1 \text{ mol C}_6\text{H}_{12}\text{O}_6} = \boxed{0.800 \text{ mol CO}_2}$

b. How many grams of  $\text{C}_6\text{H}_{12}\text{O}_6$  are needed to form 7.50 g of  $\text{C}_2\text{H}_5\text{OH}$ ?

(FM x mole Ratio x FM)  $\frac{7.50 \text{ g C}_2\text{H}_5\text{OH}}{46.07 \text{ g/mol}} = 0.1628 \text{ mol C}_2\text{H}_5\text{OH} \times \frac{1 \text{ mol C}_6\text{H}_{12}\text{O}_6}{2 \text{ mol C}_2\text{H}_5\text{OH}} = 0.0814 \text{ mol C}_6\text{H}_{12}\text{O}_6 \times 180.162 \frac{\text{g}}{\text{mol}} = \boxed{14.7 \text{ g C}_6\text{H}_{12}\text{O}_6}$

c. How many Liters of  $\text{CO}_2$  form when 7.50 g of  $\text{C}_2\text{H}_5\text{OH}$  are produced?

$\frac{7.50 \text{ g C}_2\text{H}_5\text{OH}}{46.07 \text{ g/mol}} = 0.1628 \text{ mol C}_2\text{H}_5\text{OH} \times \frac{2 \text{ mol CO}_2}{2 \text{ mol C}_2\text{H}_5\text{OH}} = 0.1628 \text{ mol CO}_2 \times \frac{22.4 \text{ L}}{\text{mol}} = \boxed{3.65 \text{ L CO}_2}$

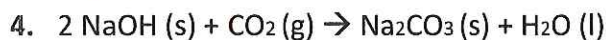


a. Calculate the number of grams of CO that can react with 0.150 kg of  $\text{Fe}_2\text{O}_3$

$0.150 \text{ kg} \rightarrow 150 \text{ g}$   
 $\frac{150 \text{ g Fe}_2\text{O}_3}{159.70 \text{ g/mol}} = 0.9393 \text{ mol Fe}_2\text{O}_3 \times \frac{3 \text{ mol CO}}{1 \text{ mol Fe}_2\text{O}_3} = 2.82 \text{ mol CO} \times 28.01 \frac{\text{g}}{\text{mol}} = \boxed{79.0 \text{ g CO}}$

b. Calculate the number of liters of  $\text{CO}_2$  formed when 0.150 kg of  $\text{Fe}_2\text{O}_3$  reacts

$\frac{150 \text{ g Fe}_2\text{O}_3}{159.70 \text{ g/mol}} = 0.9393 \text{ mol Fe}_2\text{O}_3 \times \frac{3 \text{ mol CO}_2}{1 \text{ mol Fe}_2\text{O}_3} = 2.82 \text{ mol CO}_2 \times 22.4 \frac{\text{L}}{\text{mol}} = \boxed{63.1 \text{ L CO}_2}$

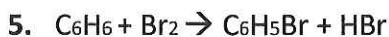


a. How many liters of  $\text{CO}_2$  are needed to completely react with 15.2 grams of NaOH

$\frac{15.2 \text{ g NaOH}}{39.998 \text{ g/mol}} = 0.3800 \text{ mol NaOH} \times \frac{1 \text{ mol CO}_2}{2 \text{ mol NaOH}} = 0.1900 \text{ mol CO}_2 \times 22.4 \frac{\text{L}}{\text{mol}} = \boxed{4.26 \text{ L CO}_2}$

b. How many moles of  $\text{Na}_2\text{CO}_3$  can be produced from 1.85 moles of NaOH?

$1.85 \text{ mol NaOH} \times \frac{1 \text{ mol Na}_2\text{CO}_3}{2 \text{ mol NaOH}} = \boxed{0.925 \text{ mol Na}_2\text{CO}_3}$

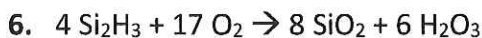


a. How many grams of  $C_6H_6$  is needed in this reaction to produce 30.0 g of  $C_6H_5Br$ ?

$$\frac{30.0 \text{ g } C_6H_5Br}{157.0 \text{ g/mol}} = 0.1911 \text{ mol } C_6H_5Br \times \frac{1 \text{ mol } C_6H_6}{1 \text{ mol } C_6H_5Br} = 0.1911 \text{ mol } C_6H_6 \times \frac{78.108 \text{ g}}{\text{mol}} = \boxed{14.9 \text{ g } C_6H_6}$$

b. How many liters of  $Br_2$  is needed to completely react and form 12.5 grams of  $HBr$

$$\frac{12.5 \text{ g } HBr}{80.908 \text{ g/mol}} = 0.1545 \text{ mol } HBr \times \frac{1 \text{ mol } Br_2}{1 \text{ mol } HBr} = 0.1545 \text{ mol } Br_2 \times \frac{22.4 \text{ L}}{\text{mol}} = \boxed{3.46 \text{ L } Br_2}$$



a. How many grams of Silicon dioxide will be formed if  $6 \times 10^{28}$  molecules of oxygen react completely?

$$\frac{6 \times 10^{28} \text{ molecules } O_2}{6.023 \text{ molecules/mol}} = 1000 \text{ mol } O_2 \times \frac{8 \text{ mol } SiO_2}{17 \text{ mol } O_2} = 470.6 \text{ mol } SiO_2 \times \frac{60.09 \text{ g}}{\text{mol}} = \boxed{2.83 \times 10^4 \text{ g } SiO_2}$$

b. How many moles of oxygen are equal to  $6.02 \times 10^{25}$  molecules of oxygen?

$$\frac{6.02 \times 10^{25} \text{ molecules } O_2}{6.02 \times 10^{23} \text{ molecules/mol}} = \boxed{100 \text{ mol } O_2}$$