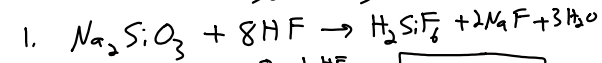


Stoichiometry, WS

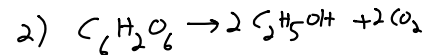
Solutions



a) $.3 \text{ mol Na}_2\text{Si}_2\text{O}_7 \times \frac{8 \text{ mol HF}}{1 \text{ mol Na}_2\text{Si}_2\text{O}_7} = 2.4 \text{ mol HF}$

b) $.5 \text{ mol HF} \times \frac{2 \text{ mol NaF}}{8 \text{ mol HF}} \times \frac{42 \text{ g NaF}}{\text{mol NaF}} = 5.25 \text{ g NaF}$

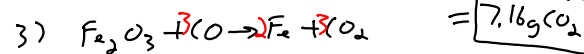
c) $.8 \text{ g HF} \times \frac{\text{mol HF}}{20 \text{ g HF}} \times \frac{1 \text{ mol Na}_2\text{Si}_2\text{O}_7}{8 \text{ mol HF}} \times \frac{100 \text{ g Na}_2\text{Si}_2\text{O}_7}{\text{mol Na}_2\text{Si}_2\text{O}_7} = .6 \text{ g Na}_2\text{Si}_2\text{O}_7$



a) $.4 \text{ mol C}_6\text{H}_{12}\text{O}_6 \times \frac{2 \text{ mol CO}_2}{1 \text{ mol C}_6\text{H}_{12}\text{O}_6} = .8 \text{ mol CO}_2$

b) $7.5 \text{ g C}_2\text{H}_5\text{OH} \times \frac{\text{mol C}_2\text{H}_5\text{OH}}{46 \text{ g C}_2\text{H}_5\text{OH}} \times \frac{1 \text{ mol C}_6\text{H}_{12}\text{O}_6}{2 \text{ mol C}_2\text{H}_5\text{OH}} \times \frac{180 \text{ g C}_6\text{H}_{12}\text{O}_6}{\text{mol C}_6\text{H}_{12}\text{O}_6} = 14.7 \text{ g C}_6\text{H}_{12}\text{O}_6$

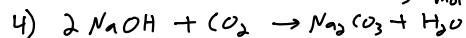
c) $7.5 \text{ g C}_2\text{H}_5\text{OH} \times \frac{\text{mol C}_2\text{H}_5\text{OH}}{46 \text{ g C}_2\text{H}_5\text{OH}} \times \frac{2 \text{ mol CO}_2}{2 \text{ mol C}_2\text{H}_5\text{OH}} \times \frac{44 \text{ g CO}_2}{\text{mol CO}_2} = 7.16 \text{ g CO}_2$



a) $.15 \text{ kg Fe}_2\text{O}_3 \times \frac{1000 \text{ g}}{1 \text{ kg}} \times \frac{\text{mol Fe}_2\text{O}_3}{160 \text{ g Fe}_2\text{O}_3} \times \frac{3 \text{ mol CO}}{1 \text{ mol Fe}_2\text{O}_3} \times \frac{28 \text{ g CO}}{\text{mol CO}} = 78.75 \text{ g CO}$

b) $.15 \text{ kg Fe}_2\text{O}_3 \times \frac{1000 \text{ g}}{1 \text{ kg}} \times \frac{\text{mol Fe}_2\text{O}_3}{160 \text{ g Fe}_2\text{O}_3} \times \frac{2 \text{ mol Fe}}{1 \text{ mol Fe}_2\text{O}_3} \times \frac{55.8 \text{ g Fe}}{\text{mol Fe}} = 105 \text{ g Fe}$

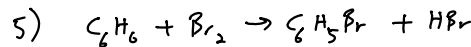
c) $.15 \text{ kg Fe}_2\text{O}_3 \times \frac{1000 \text{ g}}{1 \text{ kg}} \times \frac{\text{mol Fe}_2\text{O}_3}{160 \text{ g Fe}_2\text{O}_3} \times \frac{3 \text{ mol CO}_2}{1 \text{ mol Fe}_2\text{O}_3} \times \frac{44 \text{ g CO}_2}{\text{mol CO}_2} = 124 \text{ g CO}_2$



a) $1.85 \text{ mol NaOH} \times \frac{1 \text{ mol CO}_2}{2 \text{ mol NaOH}} = .925 \text{ mol CO}_2 \text{ needed}$

NaOH \rightarrow limiting

b) $1.85 \text{ mol NaOH} \times \frac{1 \text{ mol Na}_2\text{CO}_3}{2 \text{ mol NaOH}} = .925 \text{ mol Na}_2\text{CO}_3$



a) Find limiting

$30 \text{ g C}_6\text{H}_6 \times \frac{\text{mol C}_6\text{H}_6}{78 \text{ g C}_6\text{H}_6} \times \frac{1 \text{ mol Br}_2}{1 \text{ mol C}_6\text{H}_6} \times \frac{160 \text{ g Br}_2}{\text{mol Br}_2} = 61.5 \text{ g Br}_2 \text{ needed}$

$\text{C}_6\text{H}_6 = \text{limiting}$

b) $30 \text{ g C}_6\text{H}_6 \times \frac{\text{mol C}_6\text{H}_6}{78 \text{ g C}_6\text{H}_6} \times \frac{1 \text{ mol C}_6\text{H}_5\text{Br}}{1 \text{ mol C}_6\text{H}_6} \times \frac{157 \text{ g C}_6\text{H}_5\text{Br}}{\text{mol C}_6\text{H}_5\text{Br}} = 60.38 \text{ g C}_6\text{H}_5\text{Br}$

b) Actual = 56.7

$\% \text{ Yield} = \frac{56.7}{60.38} \times 100 = 93.9\%$