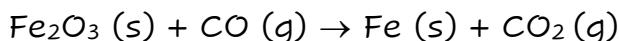


## Stoichiometry Part 2

Consider the following chemical equation to answer the questions.



a) Balance the equation



b) How many grams of  $\text{Fe}_2\text{O}_3$  are required to react with 8.75 g of CO? (Don't forget to write a roadmap, write equivalences, and write the mole ratios)

$$\text{Mole ratios: } \frac{1 \text{ mol Fe}_2\text{O}_3}{3 \text{ mol CO}} \text{ or } \frac{3 \text{ mol CO}}{1 \text{ mol Fe}_2\text{O}_3}$$

Roadmap:  $\text{g CO} \rightarrow \text{mol CO} \rightarrow \text{mol Fe}_2\text{O}_3 \rightarrow \text{g Fe}_2\text{O}_3$

Equivalences:  $1 \text{ mol CO} = 28.01 \text{ g}$ ,  $3 \text{ mol CO} = 1 \text{ mol Fe}_2\text{O}_3$   
 $1 \text{ mol Fe}_2\text{O}_3 = 159.69 \text{ g}$

$$8.75 \text{ g CO} \times \frac{1 \text{ mol CO}}{28.01 \text{ g}} \times \frac{1 \text{ mol Fe}_2\text{O}_3}{3 \text{ mol CO}} \times \frac{159.69 \text{ g}}{1 \text{ mol Fe}_2\text{O}_3} = \mathbf{16.6 \text{ g Fe}_2\text{O}_3}$$

c) How many grams of solid iron are produced if 8.75 g of CO is reacted?

$$\text{Mole ratios: } \frac{2 \text{ mol Fe}}{3 \text{ mol CO}} \text{ or } \frac{3 \text{ mol CO}}{2 \text{ mol Fe}}$$

Roadmap:  $\text{g CO} \rightarrow \text{mol CO} \rightarrow \text{mol Fe} \rightarrow \text{g Fe}$

Equivalences:  $1 \text{ mol CO} = 28.01 \text{ g}$ ,  $3 \text{ mol CO} = 2 \text{ mol Fe}$ ,  
 $1 \text{ mole Fe} = 55.845 \text{ g}$

$$8.75 \text{ g CO} \times \frac{1 \text{ mol CO}}{28.01 \text{ g}} \times \frac{2 \text{ mol Fe}}{3 \text{ mol CO}} \times \frac{55.845 \text{ g}}{1 \text{ mol Fe}} = \mathbf{11.6 \text{ g Fe}}$$

d) How many grams of solid iron are produced if 10.65 g of  $\text{Fe}_2\text{O}_3$  reacts with excess CO?

$$\text{Mole ratios: } \frac{1 \text{ mol Fe}_2\text{O}_3}{2 \text{ mol Fe}} \text{ or } \frac{2 \text{ mol Fe}}{1 \text{ mol Fe}_2\text{O}_3}$$

Roadmap:  $\text{g Fe}_2\text{O}_3 \rightarrow \text{mol Fe}_2\text{O}_3 \rightarrow \text{mol Fe} \rightarrow \text{g Fe}$

Equivalences:  $1 \text{ mol Fe}_2\text{O}_3 = 159.69 \text{ g}$ ,  $1 \text{ mol Fe}_2\text{O}_3 = 2 \text{ mol Fe}$ ,  
 $1 \text{ mol Fe} = 55.845 \text{ g}$

$$10.65 \text{ Fe}_2\text{O}_3 \times \frac{1 \text{ mol Fe}_2\text{O}_3}{159.69 \text{ g}} \times \frac{2 \text{ mol Fe}}{1 \text{ mol Fe}_2\text{O}_3} \times \frac{55.845 \text{ g Fe}}{1 \text{ mol Fe}} = \mathbf{7.45 \text{ g Fe}}$$