

## Exercise 1.4

### Stoichiometry Basics

1. When propane ( $\text{C}_3\text{H}_8(\text{g})$ ) is combusted (reacted with  $\text{O}_2$ ), the products are water vapour and carbon dioxide.
  - (a) What mass of  $\text{O}_2$  is required to fully react with 25 g of propane?
  - (b) What mass of water vapour is produced from the combustion of 25 g of propane?
  - (c) What mass of carbon dioxide is produced from the combustion of 25 g of propane?
  - (d) Verify that your answers to parts (a), (b) and (c) are consistent with the Law of Conservation of Mass.
  
2. When iron (Fe) rusts (reacts with  $\text{O}_2$ ), the product is iron(III) oxide ( $\text{Fe}_2\text{O}_3$ ).  
If 25 g Fe is reacted with 25 g  $\text{O}_2$  in a sealed container, what are the masses of Fe,  $\text{O}_2$  and  $\text{Fe}_2\text{O}_3$  in the container after the reaction is complete?