

WORKSHEET 1

1 Write a skeleton equation for each of these chemical reactions. Include appropriate symbols from Table 7.1.

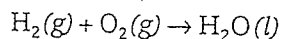
- Solid sulfur burns in oxygen gas to form sulfur dioxide gas.
- Oxygen gas can be made by heating potassium chlorate in the presence of the catalyst manganese(IV) oxide. Potassium chloride is left as a solid residue.
- When solid mercury(II) sulfide is heated with oxygen, liquid mercury metal and gaseous sulfur dioxide are produced.

2 Write sentences that completely describe each of the chemical reactions shown in these skeleton equations.

- $\text{NH}_3(g) + \text{O}_2(g) \xrightarrow{\text{Pt}} \text{NO}(g) + \text{H}_2\text{O}(g)$
- $\text{H}_2\text{SO}_4(aq) + \text{BaCl}_2(aq) \longrightarrow \text{BaSO}_4(s) + \text{HCl}(aq)$
- $\text{N}_2\text{O}_3(g) + \text{H}_2\text{O}(l) \longrightarrow \text{HNO}_2(aq)$

3 What is the purpose of balancing an equation?

4 The equation for the formation of water from its elements,



can easily be "balanced" by changing the formula of the product to H_2O_2 . Explain why this is incorrect.

5 Balance the following equations. In doing problems in this chapter, you may ignore the physical states of products and reactants unless they are specifically required.

- $\text{PbO}_2 \rightarrow \text{PbO} + \text{O}_2$
- $\text{P} + \text{O}_2 \rightarrow \text{P}_4\text{O}_{10}$
- $\text{Al} + \text{N}_2 \rightarrow \text{AlN}$
- $\text{Fe}(\text{OH})_3 \rightarrow \text{Fe}_2\text{O}_3 + \text{H}_2\text{O}$
- $(\text{NH}_4)_2\text{CO}_3 \rightarrow \text{NH}_3 + \text{H}_2\text{O} + \text{CO}_2$
- $\text{NaCl} + \text{H}_2\text{SO}_4 \rightarrow \text{Na}_2\text{SO}_4 + \text{HCl}$
- $\text{H}_2 + \text{Fe}_3\text{O}_4 \rightarrow \text{Fe} + \text{H}_2\text{O}$
- $\text{Al} + \text{CuSO}_4 \rightarrow \text{Al}_2(\text{SO}_4)_3 + \text{Cu}$

6 Rewrite these word equations as balanced chemical equations.

- carbon + oxygen \rightarrow carbon monoxide
- potassium nitrate \rightarrow potassium nitrite + oxygen
- hydrogen + sulfur \rightarrow hydrogen sulfide
- iron(III) chloride + calcium hydroxide \rightarrow iron(III) hydroxide + calcium chloride
- sodium + water \rightarrow sodium hydroxide + hydrogen