YEAR 11 CHEMISTRY THE CHEMISTS RECIPE

WORKSHEET 1

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

a. Solid sulfur burns in oxygen gas to form sulfur dioxide gas.

b. 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.

c. 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.

a. $NH_3(g) + O_2(g) \xrightarrow{Pt} NO(g) + H_2O(g)$

b. $H_2SO_4(aq) + BaCl_2(aq) \longrightarrow BaSO_4(s) + HCl(aq)$

c. $N_2O_3(g) + H_2O(l) \longrightarrow HNO_2(aq)$

3 What is the purpose of balancing an equation?

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

$$H_2(g) + O_2(g) \rightarrow H_2O(l)$$

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.

a. $PbO_2 \rightarrow PbO + O_2$

b. $P + O_2 \rightarrow P_4O_{10}$

c. $Al + N_2 \rightarrow AlN$

d. $Fe(OH)_3 \rightarrow Fe_2O_3 + H_2O$

e. $(NH_4)_2CO_3 \rightarrow NH_3 + H_2O + CO_2$

f. $NaCl + H_2SO_4 \rightarrow Na_2SO_4 + HCl$

g. $H_2 + Fe_3O_4 \rightarrow Fe + H_2O$

h. $Al + CuSO_4 \rightarrow Al_2(SO_4)_3 + Cu$

6. Rewrite these word equations as balanced chemical equations.

a. carbon + oxygen → carbon monoxide

b. potassium nitrate → potassium nitrite + oxygen

c. hydrogen + sulfur → hydrogen sulfide

d. iron(III) chloride + calcium hydroxide → iron(III) hydroxide + calcium chloride

e. sodium + water → sodium hydroxide + hydrogen