1 Hydrogen and oxygen react to produce water.

Balance the symbol equation below which represents this reaction. [1 mark]

\[ 2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O} \]

1 (a) (i) Metals can react with oxygen in the air to produce metal oxides. The reaction below represents one of these reactions.

Balance the symbol equation below which represents this reaction. [1 mark]

\[ 4\text{Al} + 3\text{O}_2 \rightarrow 2\text{Al}_2\text{O}_3 \]

1 (b) Sodium and water react to produce sodium hydroxide and hydrogen gas. The word and balanced symbol equations below show the reaction.

sodium + water \[\rightarrow\] sodium hydroxide + hydrogen

\[ 2\text{Na} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2 \]

1 (b) (i) Why is a balanced symbol equation better at describing the reaction than a word equation? [2 marks]

- Tells you the number of atoms reacting [1]
- Shows no atoms are lost or gained or number of atoms are the same on both sides [1]

1 (b) (ii) For the above reaction, the total mass of the sodium and water that reacted was 84 grams. The mass of the hydrogen produced was 4 grams.

What is the mass of the sodium hydroxide produced. [1 mark]

\[ 84 - 4 = 80 \] grams

Mass of sodium hydroxide = 80 [2] grams

Explain your answer. [2 marks]

- No atoms are lost or made [1]
- Mass of the products must equal mass of the reactants [1]

(Total 7 marks)