Do not write outside the box

1 Hydrogen and oxygen react to produce water.

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

$2H_2$ + O_2 ⟶ $2H_2O$

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]**

$4Al$ + $3O_2$ ⟶ $2Al_2O_3$

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 ⟶ sodium hydroxide + hydrogen

$2Na$ + $2H_2O$ ⟶ $2NaOH$ + 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 [1]

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]

From the spec: 'Candidates should be able to calculate the mass of a reactant or product from information about the masses of the other reactants and products in the reaction.'

(Total 7 marks)

End