Oxford Cambridge and RSA

GCSE Chemistry B (Twenty First Century Science)

J258/03 Breadth in chemistry (Higher Tier)

Question Set 10

1 Hydrogen for use as a fuel can be made by the electrolysis of water.

(a) Which statements about the electrolysis of water are correct?

Tick (✓) **two** boxes.

The equation for the formation of hydrogen gas is $2H^+ + 2e^- \rightarrow H$. ☐

Hydrogen is produced at the cathode. ☐

Water contains H^+ and OH^- ions. ☐

Hydrogen ions are oxidised. ☐

[1]

(b) This is an equation for the overall reaction that happens when water is electrolysed.

2H–O–H → 2H–H + O=O

Bond	Energy change (kJ / mol)
H–H	434
O=O	498
O–H	464

Use data in the table to calculate the energy needed to break and make bonds during the reaction.

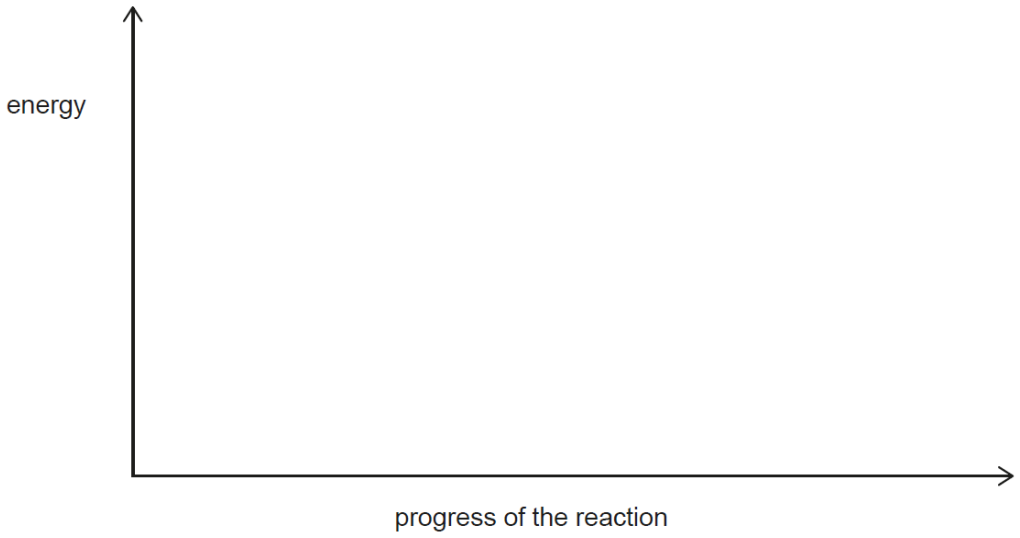
Use your answers to calculate the energy change of the reaction.

Energy change = ... kJ / mol **[3]**

(c) Complete the reaction profile for the electrolysis of water.

Use these words to label the reaction profile.

hydrogen **oxygen** **water** **activation energy**



[3]

Total Marks for Question Set 10: 7