

0	1
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Hydrogen peroxide is a chemical that decomposes to produce oxygen and water.

The structural formulae of the chemicals involved are:

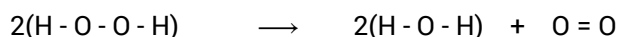


Table 1

BOND	BOND ENERGY (kJ)
O = O	498
O – O	146
H – O	464

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Use the structural formulae above and information from Table 1 to calculate the energy required to break the bonds in the reactant.

$$4 \times 464 = 1856 \text{ [1]} \quad + \quad 2 \times 146 = 292 \text{ [1]}$$

$$\text{Total} = 2148 \text{ kJ [2 marks]}$$

DON'T FORGET :

You are often given full marks for writing just the correct answer, but you must show your working in case you make a mistake. Easy to make a mistake under exam conditions.

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Calculate the energy released when new bonds are formed in the products.

[2 marks]

$$(\text{H}-\text{O}) = 4 \times 464 = 1856 \text{ [1]} \quad + \quad (\text{O}=\text{O}) = 498 \text{ [1]}$$

$$\text{Total} = 2354 \text{ kJ [2]}$$

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Is the reaction endothermic or exothermic?

[2 marks]

exothermic [1]

Explain why.

because energy released when new bonds are formed (01.2) is greater than energy required to break the bonds (01.1)

or

because (more) heat is given out (than put in)

or

overall energy change is negative [1]

(Total 6 marks)

End