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Explain how the active site of an enzyme causes a high rate of reaction.

[3 marks]



The action of the enzyme catalase is shown below.



A student investigated the effect of hydrogen peroxide concentration on the rate of this reaction. He used catalase from potato tissue.

The student:

- put five potato chips in a flask
- added 20 cm³ of 0.5 mol dm⁻³ hydrogen peroxide solution to the flask
- measured the time in seconds for production of 10 cm³ of oxygen gas
- repeated this procedure with four different concentrations of hydrogen peroxide solution.

His results are shown in **Table 5**.

Table 5

Hydrogen peroxide concentration / mol dm ⁻³	Time for production of 10 cm ³ of oxygen gas / seconds	Rate of reaction / arbitrary units
0.5	18	
1.0	10	
1.5	7	
2.0	6	
2.5	6	

0 7 . 2

Other than those stated, give **one** factor the student would have controlled in his investigation.

[1 mark]



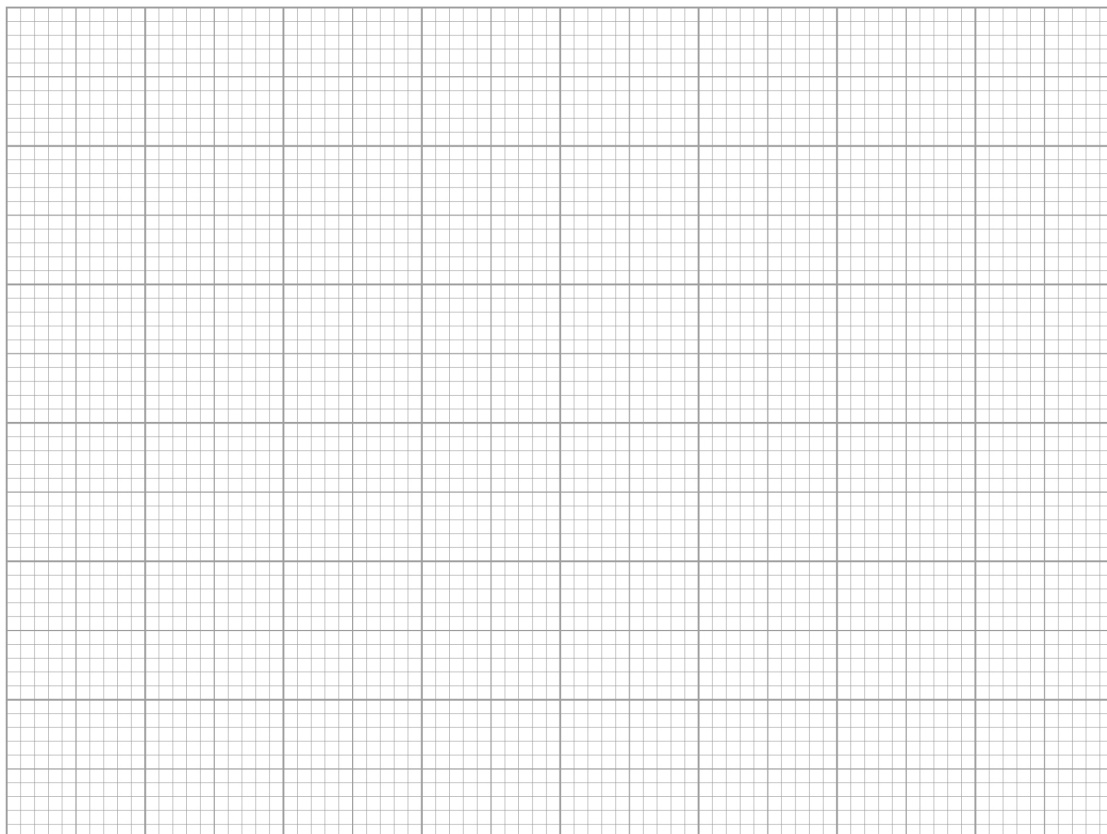
0 7 . 3 The student gave the maximum rate of reaction a value of 1.0 arbitrary units.

Complete **Table 5** by calculating the rate of reaction in arbitrary units at each hydrogen peroxide concentration. Record the rates using an appropriate number of significant figures.

[2 marks]

0 7 . 4 Plot a suitable graph of your processed data shown in **Table 5**.

[3 marks]



0 7 . 5 Suggest a change the student could make to his procedure so that 10 cm³ of oxygen would be produced in less than 6 seconds.

[1 mark]

10

Turn over ►

