

## 5. Reaction rate of sucrose hydrolysis

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Other group member(s)	Student number:	Name:
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Date of report submission (yyyy/mm/dd):\_\_\_\_\_

Dates of experiment (yyyy/mm/dd) 1<sup>st</sup> day: \_\_\_\_\_; 2<sup>nd</sup> day: \_\_\_\_\_

Write concisely (in the space provided)

### 【Summary of Experiment】

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There is a vertical margin line on the left side, creating a narrow left margin. The paper appears to be from a notebook or a standard ruled document.

**【Results】**

## 1. Preparation of diluted HCl solution

Volume / cm <sup>3</sup>	Concentration / mol dm <sup>-3</sup>

## 2. Preparation of aqueous sucrose solution

Mass / g	Concentration / g dm <sup>-3</sup>

## 3. Variation in optical rotation angle with time

- Enter the data in the tables overleaf.
- Provide the corresponding graph on a separate sheet (horizontal axis:  $t$ ; vertical axis:  $|\alpha_t - \alpha_e|$ )

## 4. Rate constant

No	Temperature / K	Rate constant $k$ / s <sup>-1</sup>
1		
2		
3		
Mean		

## 5. Activation energy

- Provide the corresponding Arrhenius plot on a separate sheet

$E_a$ / kJ mol <sup>-1</sup>

**【Questions】**

1. Compare the activation energy calculated above with reported values in the literature.
2. Comment on sources of experimental error.
3. Comment on what improvements and innovations could be made to improve the accuracy of these measurements.
4. Comment on any additional observations from this experiment.

Data table No. 1

Temperature: \_\_\_\_\_ °C  $\alpha_e$ : \_\_\_\_\_ degrees

	$t / \text{min}$	$t / \text{s}$	$\alpha_t / ^\circ$	$ \alpha_t - \alpha_e  / ^\circ$	$\ln( \alpha_t - \alpha_e  / ^\circ)$	Extent of reaction $ \alpha_0 - \alpha_t  /  \alpha_0 - \alpha_e $
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Data table No. 2

Temperature: \_\_\_\_\_ °C  $\alpha_e$ : \_\_\_\_\_ degrees

	$t / \text{min}$	$t / \text{s}$	$\alpha_t / ^\circ$	$ \alpha_t - \alpha_e  / ^\circ$	$\ln( \alpha_t - \alpha_e  / ^\circ)$	Extent of reaction $ \alpha_0 - \alpha_t  /  \alpha_0 - \alpha_e $
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Data table No. 3

Temperature: \_\_\_\_\_ °C  $\alpha_e$ : \_\_\_\_\_ degrees

	$t / \text{min}$	$t / \text{s}$	$\alpha_t / ^\circ$	$ \alpha_t - \alpha_e  / ^\circ$	$\ln( \alpha_t - \alpha_e  / ^\circ)$	Extent of reaction $ \alpha_0 - \alpha_t  /  \alpha_0 - \alpha_e $
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Data table No. 4

Temperature: \_\_\_\_\_ °C  $\alpha_e$ : \_\_\_\_\_ degrees

	$t / \text{min}$	$t / \text{s}$	$\alpha_t / ^\circ$	$ \alpha_t - \alpha_e  / ^\circ$	$\ln( \alpha_t - \alpha_e  / ^\circ)$	Extent of reaction $ \alpha_0 - \alpha_t  /  \alpha_0 - \alpha_e $
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