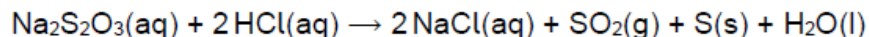


AQA – Kinetics – AS Chemistry P2

1. No.2

0 2

A student investigates the effect of temperature on the rate of reaction between sodium thiosulfate solution and dilute hydrochloric acid.



The student mixes the solutions together in a flask and places the flask on a piece of paper marked with a cross.

The student records the time for the cross to disappear. The cross disappears because the mixture becomes cloudy.

Table 2 shows the student's results.

Table 2

Temperature / °C	22	31	36	42	49	54
Time, t, for cross to disappear / s	87	48	36	26	44	12
$\frac{1}{t} / \text{s}^{-1}$	0.0115	0.0208	0.0278	0.0385	0.0227	

0 2 . 1

The student uses a stopwatch to measure the time. The stopwatch shows each time to the nearest 0.01 s

Suggest why the student records the times to the nearest second and not to the nearest 0.01 s

[1 mark]

0 2 . 2

The rate of reaction is proportional to $\frac{1}{t}$

Complete Table 2.

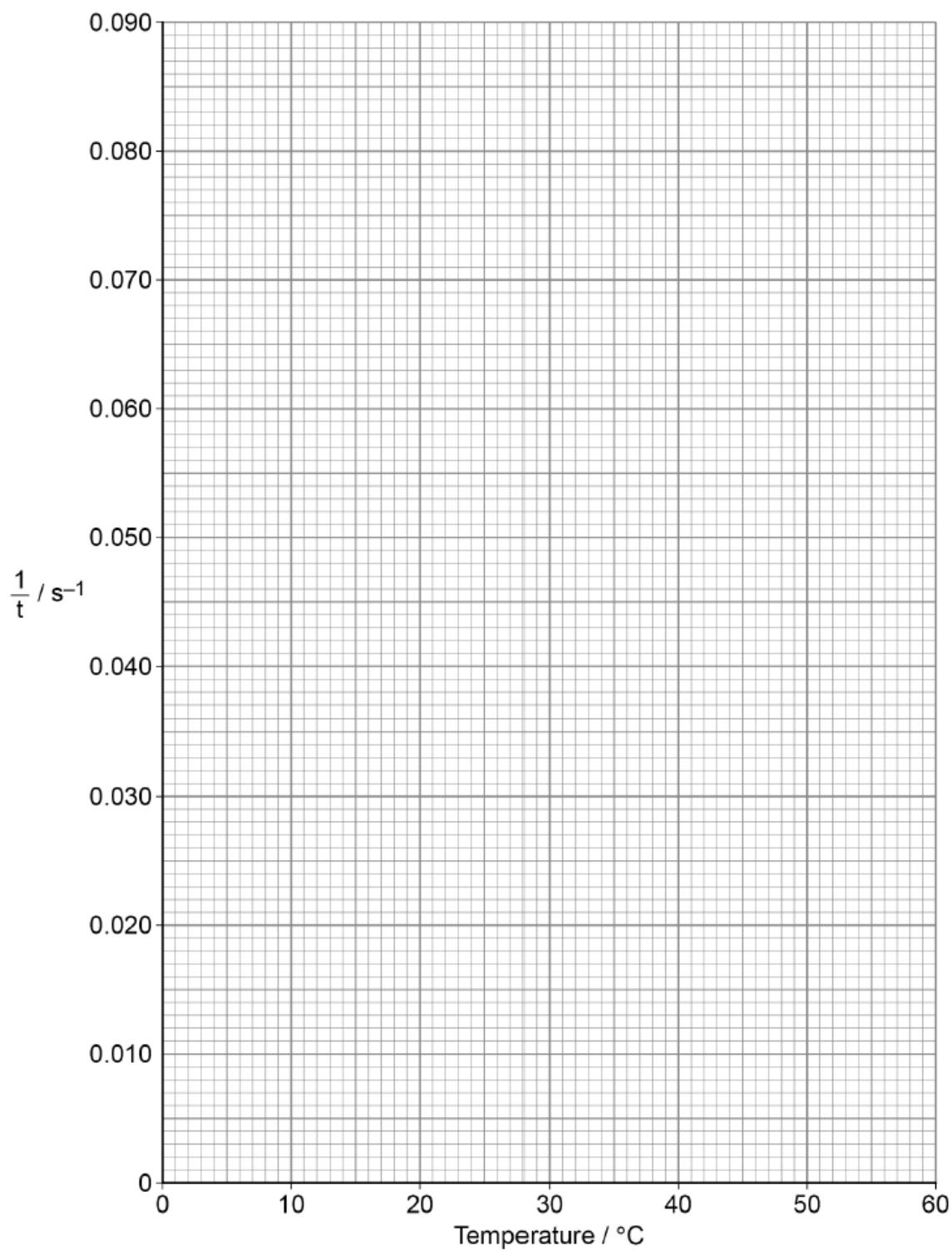
[1 mark]

0 2 . 3 Plot the values of $\frac{1}{t}$ against temperature on Figure 1.

Draw a line of best fit.

[2 marks]

Figure 1



0 2 . 4

Use your line of best fit to estimate the time for the cross to disappear at 40 °C
Show your working.

[1 mark]

Time _____ s

0 2 . 5

Suggest, by considering the products of this reaction, why small amounts of reactants are used in this experiment.

[1 mark]

0 2 . 6

The student could do the experiment at lower temperatures using an ice bath.

Suggest why the student chose **not** to carry out experiments at temperatures in the range 1–10 °C

[1 mark]

2. No.20

Which statement about the molecules in a sample of a gas is correct?

[1 mark]

- A** At a given temperature they all move at the same speed.
- B** At a given temperature their average kinetic energy is constant.
- C** As temperature increases, there are more molecules with the most probable energy.
- D** As temperature decreases, there are fewer molecules with the mean energy.

☐☐☐☐