

Name of the Student: _____

Max. Marks : 25 Marks

Time : 25 Minutes

Mark Schemes

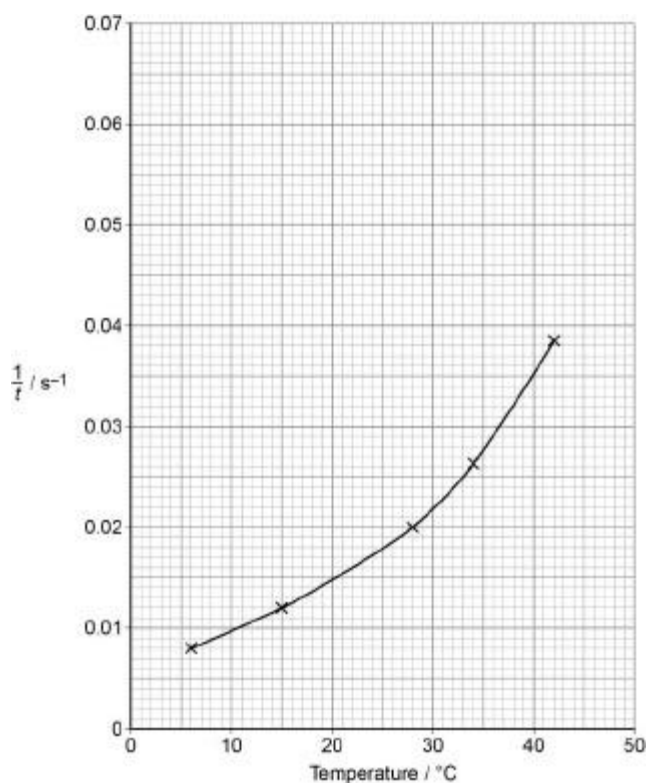
Q1.

(a) Silver iodide or AgI

If name and formula given, both must be correct

1

(b)

**M1** All points plotted (within half a square)**M2** Best fit line - slight curve (for at least 6 to 42°C)

M2 Best-fit line should be no more than one square away from each point (but allowance made for incorrectly plotted points that mean the line may be further away from some points)

M3 Use $\frac{1}{\text{reading}}$ from extrapolated line (reading within half square)

M3 typical answer = $\frac{1}{0.054} = 18.5 \text{ s}$

3

(c) **M1** Rate of reaction would be slower

Mark M1 and M2 independently (no ECF from M1 to M2)

M2 C-Br bond is stronger than C-I bond

*M2 Ignore reference to bond polarity / electronegativities / bond length;
allow C-Br bond has greater bond enthalpy/energy than C-I bond*

M3 Line for 1-bromobutane will be below that for 1-iodobutane

*M3 Ignore references to gradient, shallowness or distance between
lines*

M3 Allow ECF from faster in M1 to M3 with the line is above the original

3

[7]

Q2.

This question is marked using levels of response. Refer to the Mark Scheme Instructions for Examiners for guidance on how to mark this question.	
Level 3 5-6 marks	All stages are covered and each stage is generally correct and virtually complete. (6 v 5) Answer is well structured, with no repetition or irrelevant points, and covers all aspects of the question. Accurate and clear expression of ideas with no errors in use of technical terms.
Level 2 3-4 marks	All stages are covered but stage(s) may be incomplete or may contain inaccuracies OR two stages are covered and are generally correct and virtually complete. (4 v 3) Answer has some structure and covers most aspects of the question. Ideas are expressed with reasonable clarity with, perhaps, some repetition or some irrelevant points. If any, only minor errors in use of technical terms.
Level 1 1-2 marks	Two stages are covered but stage(s) may be incomplete or may contain inaccuracies OR only one stage is covered but is generally correct and virtually complete. (2 v 1) Answer includes statements which are presented in a logical order and / or linked.
Level 0 0 marks	Insufficient correct chemistry to gain a mark.

Stage 1 - Single distribution curve

1a suitable axis labels:

vertical: number/proportion/fraction of molecules/particles;

horizontal: (kinetic) energy

1b suitable shape (including on LHS must start reasonably close to 0,0 and RHS must not meet x-axis or rise upwards (on each curve drawn))

Stage 2 - Distribution curve at higher temperature

2a peak moves to the right and down

2b area under the curve (roughly) the same

2c lines cross once only

Stage 3 - Why a gas reacts faster at higher temperature

3a molecules have more energy

3b more molecules have the activation energy

3c higher proportion of collisions are successful / increases frequency of successful collisions

[6]

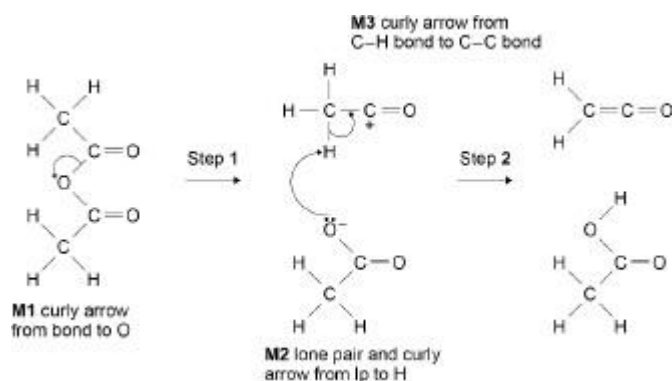
Q3.



Allow $C_nH_{2n}CO$ or $(CH_2)_nCO$ or $C_nH_{2(n-1)}O$

1

(b)



Allow other C-O bond breaking for M1

3

(c) M1 $\frac{k}{A} = e^{-E_a/RT}$

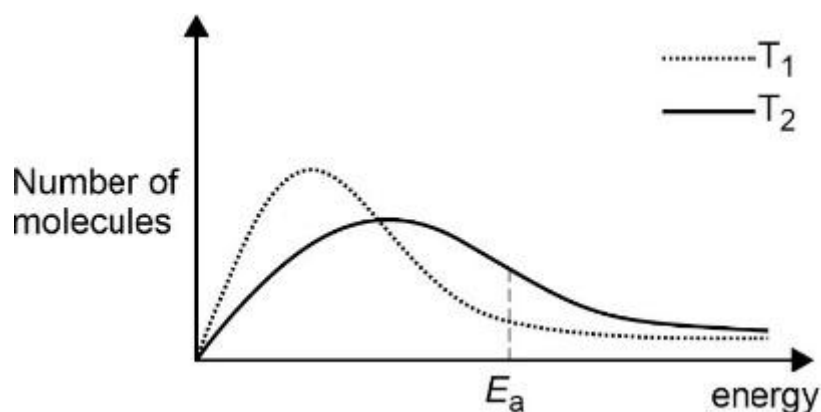
M2 $8.302 = \frac{34500}{8.31 \times T}$

M3 $T = 500 \text{ K}$

OR via $\ln k = \ln A - \frac{E_a}{RT}$ or shown with numbers

3

(d)



M5 At T_2 (many) more particles have $E \geq E_a$

M1 x axis labelled correctly (kinetic not required)

AND y axis labelled correctly allow particles

M2 E_a labelled on x axis

M3 Distribution correct shape for T_1

M4 Peak at T_2 lower with max shifted right and only crosses once

5

[12]