Paper Reference(s) 9CH0/02
Pearson Edexcel Level 3 GCE

Chemistry

Advanced

PAPER 2: Advanced Organic and Physical Chemistry

Monday 16 June 2025 – Morning

Time: 1 hour 45 minutes

Diagram Booklet

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Other names						
Centre Number						
Candidate Number						

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INSTRUCTIONS

There may be spare copies of some diagrams.

CONTENTS

Page

4 Question 3

5 Question 3(a)

6 Question 4(b)

7 Question 5

8 Question 5(c)(ii)

9 Question 5(d)

10 Question 6(b)

11 Question 7(b)(ii)

12 Question 7(c)

13 Question 8

14 Question 8(c)

15 Question 8(e)

16 Question 8(f)

17 Question 9(a)(i)

18 Question 9(a)(ii)

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19 Question 4(b) – Spare copy

20 Question 5(c)(ii) – Spare copy

21 Question 5(d) – Spare copy

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Contents continued.

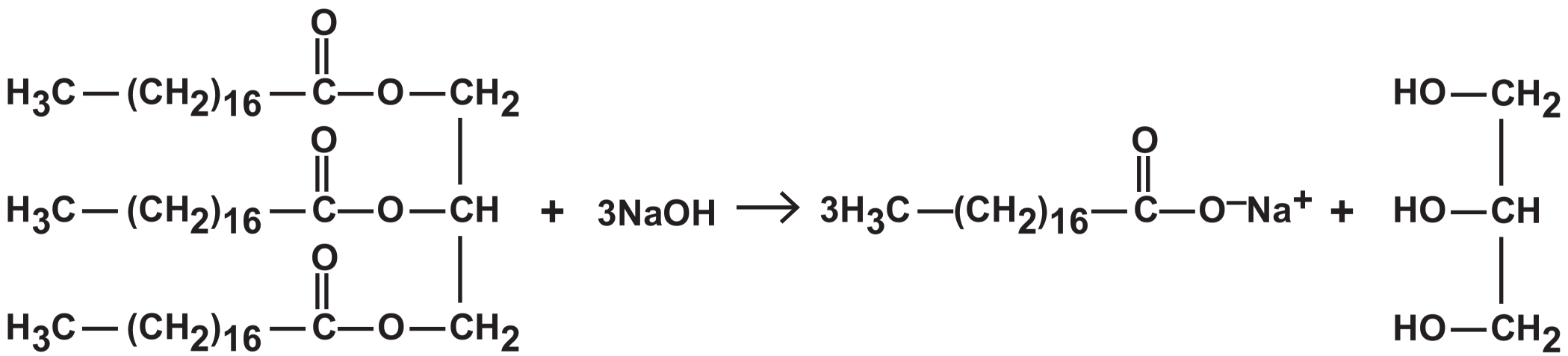
22 Question 7(c) – Spare copy

23 Question 9(a)(i) – Spare copy

24 Question 9(a)(ii) – Spare copy

Question 3

stearin		sodium stearate		glycerol



Question 3(a)

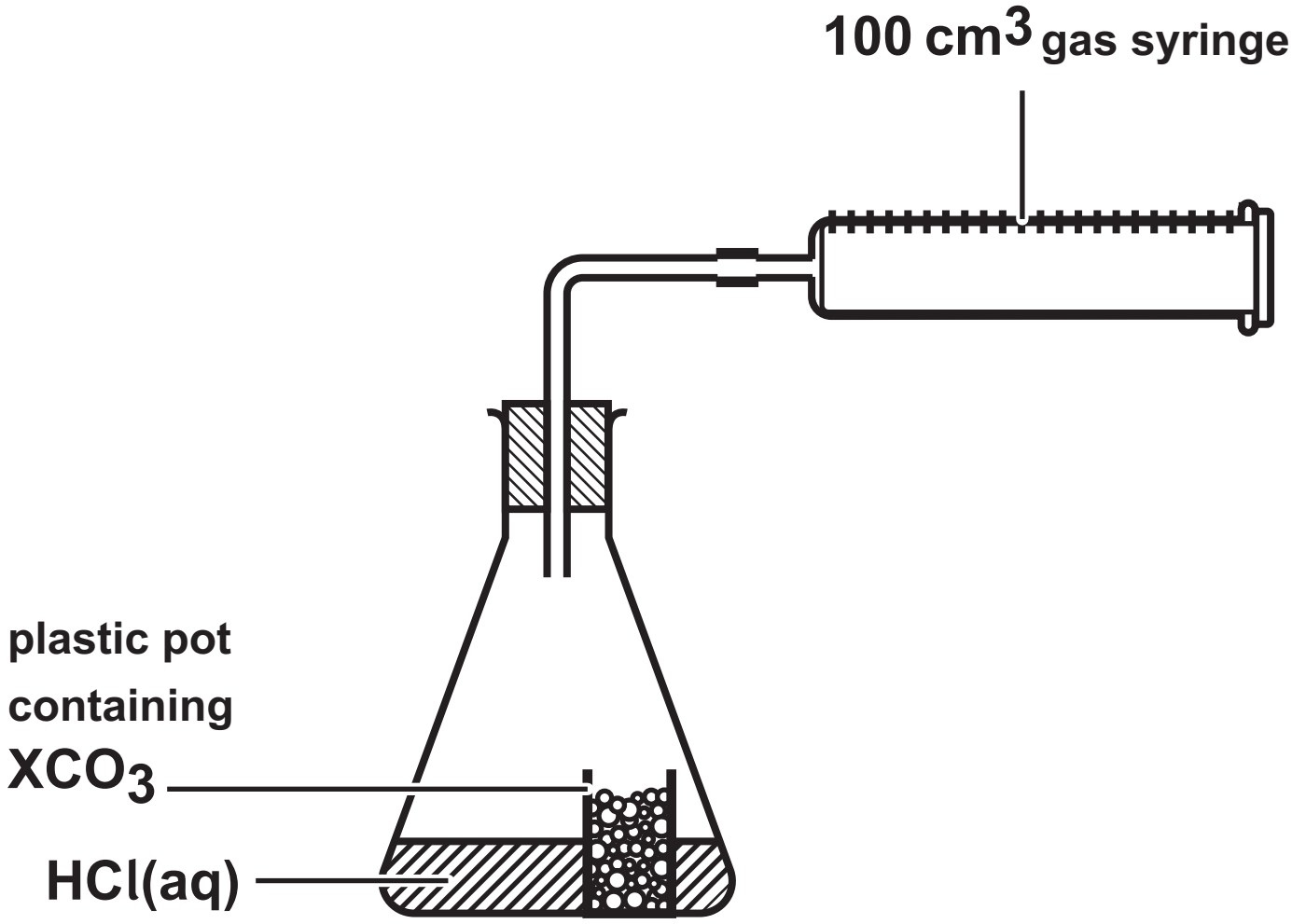
Substance	stearin	sodium hydroxide	sodium stearate	glycerol
Molar mass / g mol^{-1}	890	40	306	92

Question 4(b)

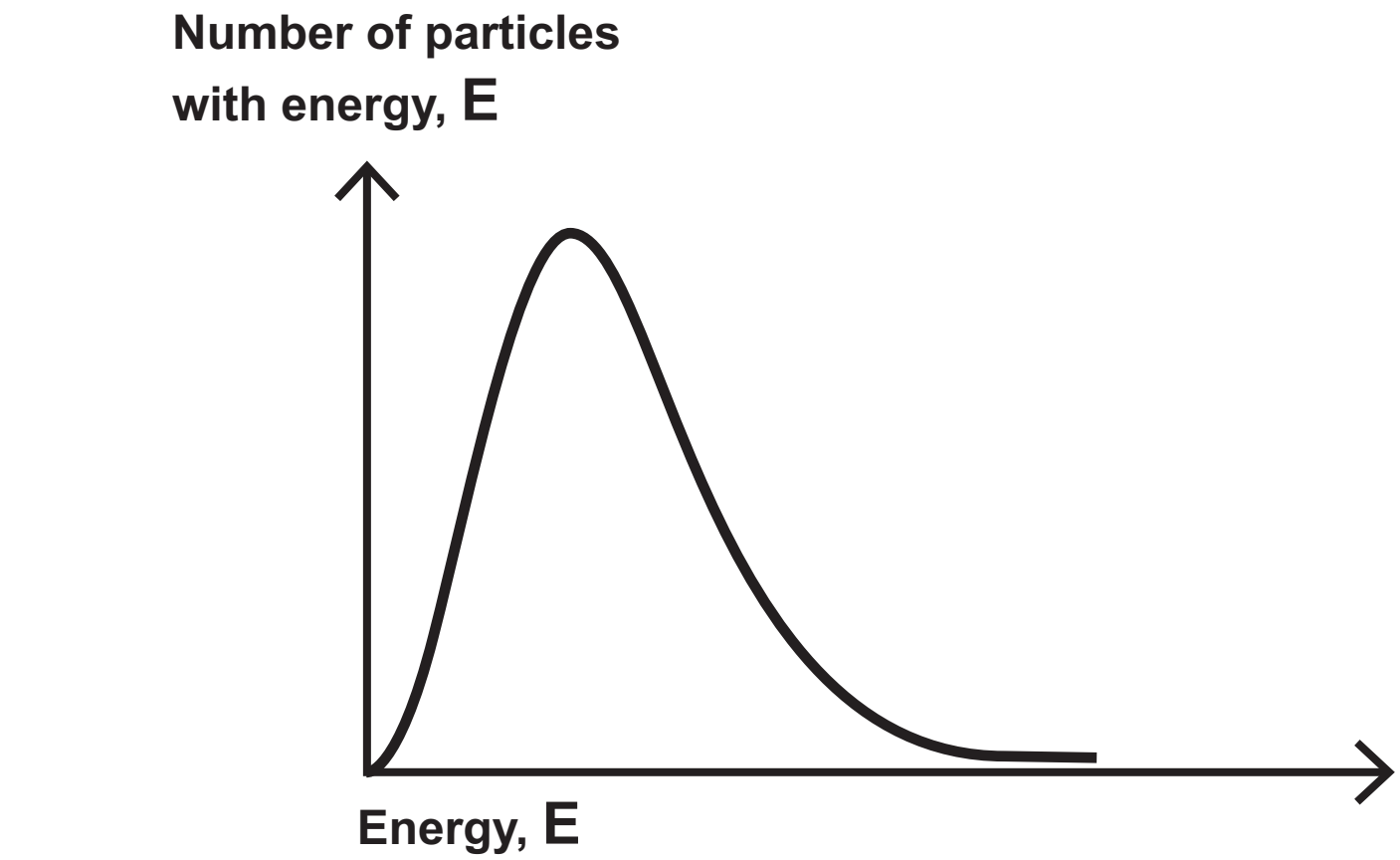
hydroxide ion

hydroxyl radical

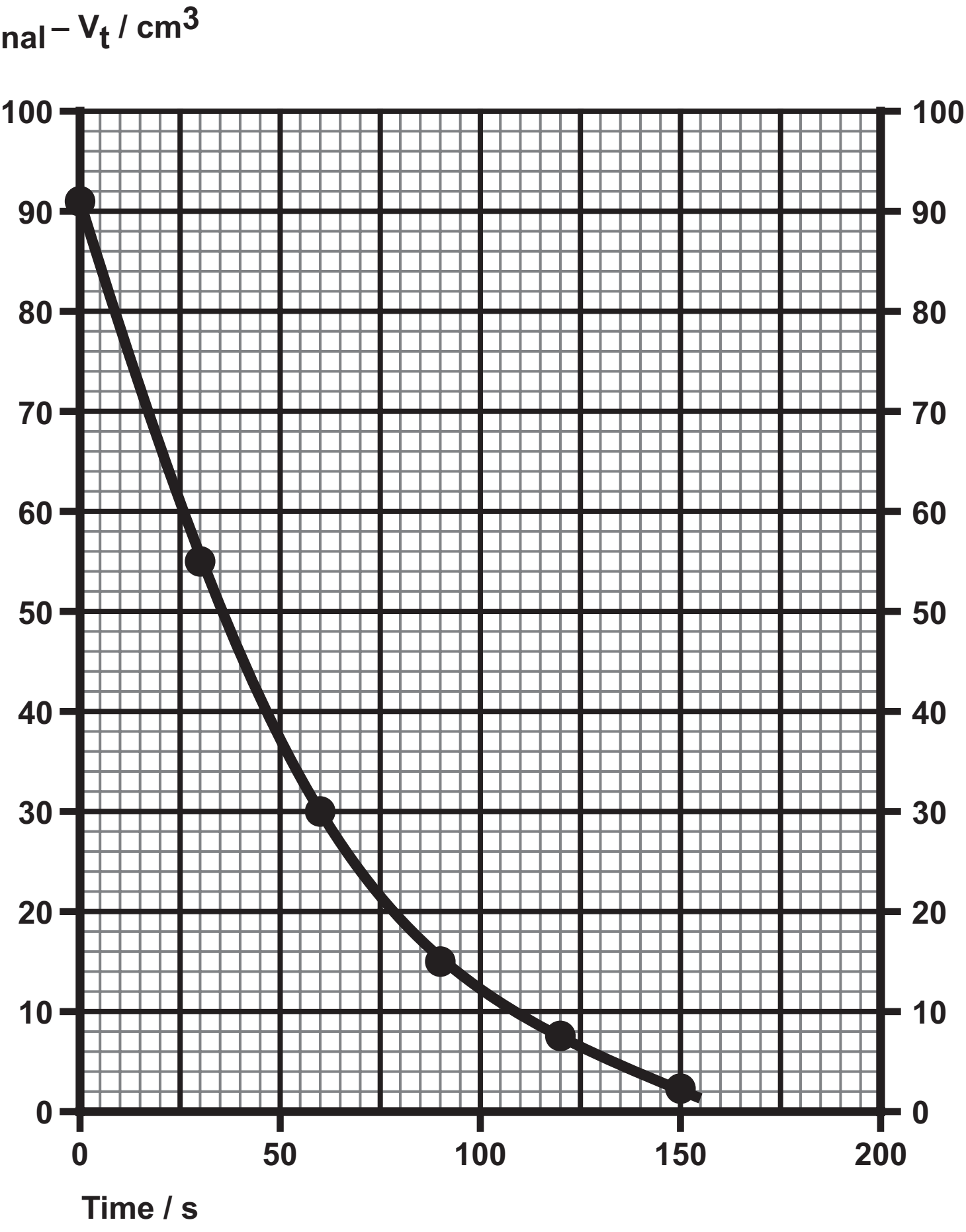
Question 5



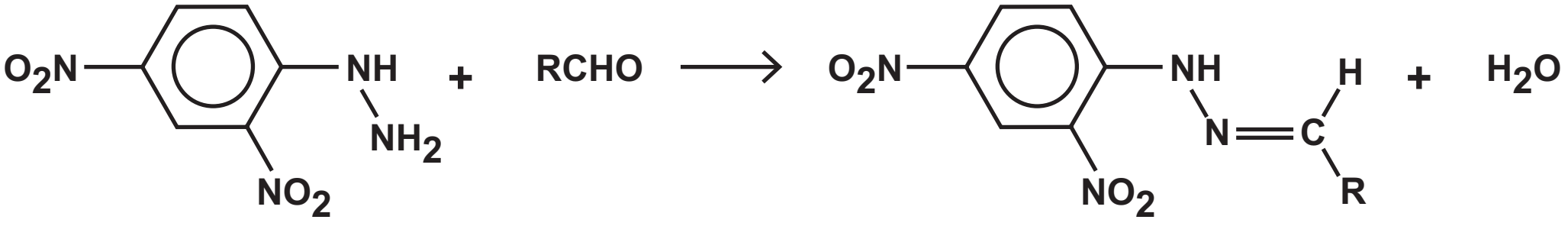
Question 5(c)(ii)



Question 5(d)


$V_{final} - V_t$ / cm^3
100
90
80
70
60
50
40
30
20
10
0
0
50
100
150
200
Time / s

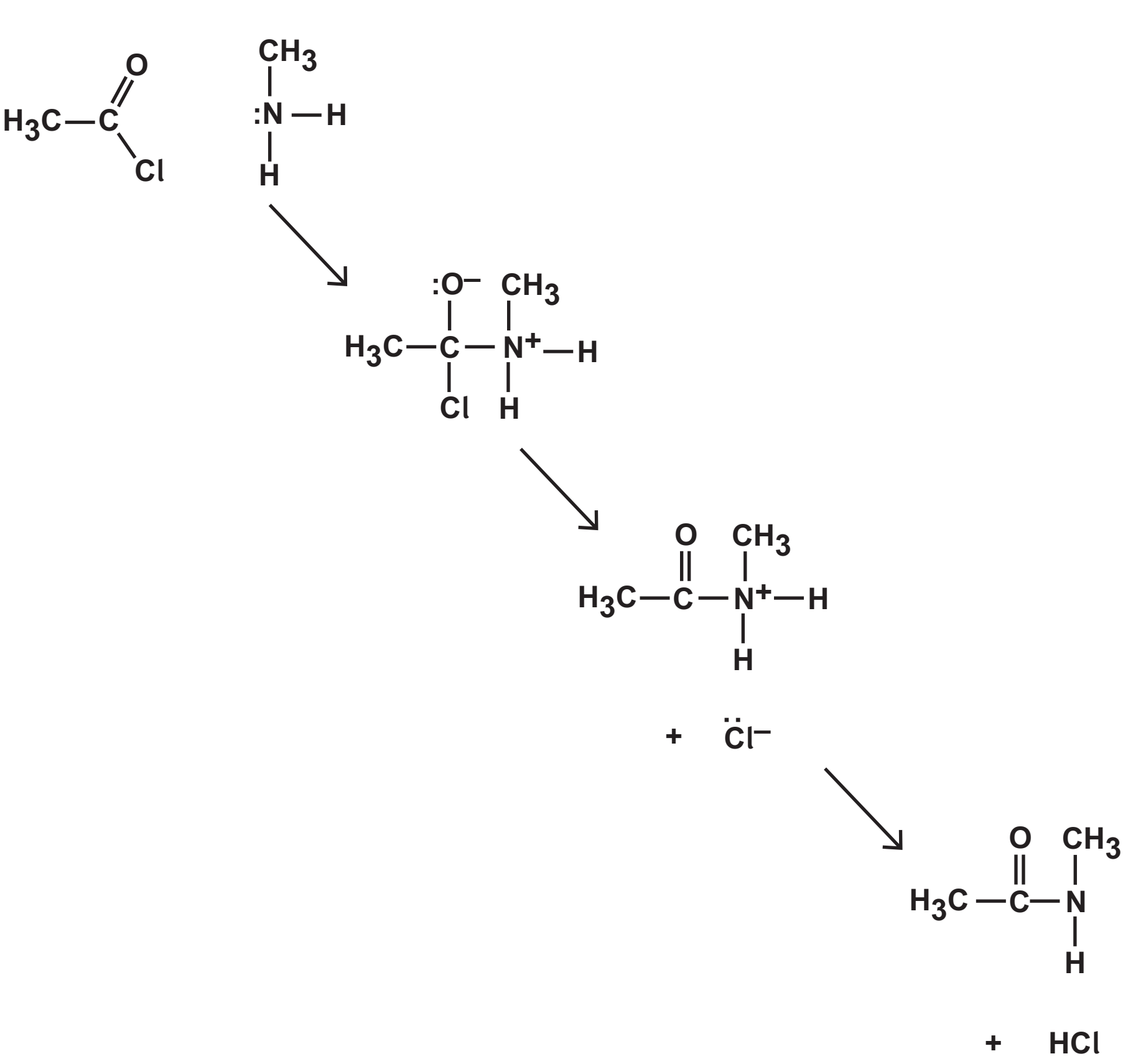
Question 6(b)



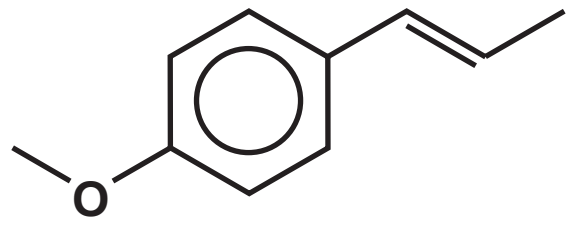
Question 7(b)(ii)

Substance	pK_{b1}
benzene-1,3-diamine	8·89
propane-1,3-diamine	3·83

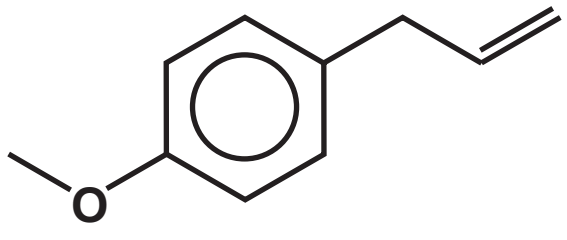
Question 7(c)


O
H3C — C
Cl
CH3
:N — H
H
:O−
CH3
H3C — C — N+ — H
Cl
H
O
CH3
H3C — C — N+ — H
H
+ Cl−
O
CH3
H3C — C — N
H
+ HCl

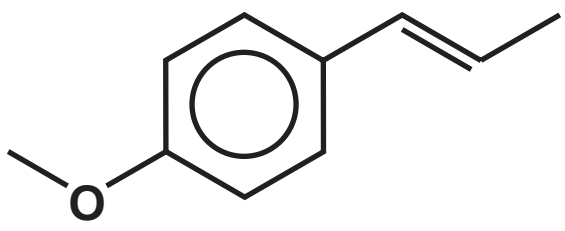
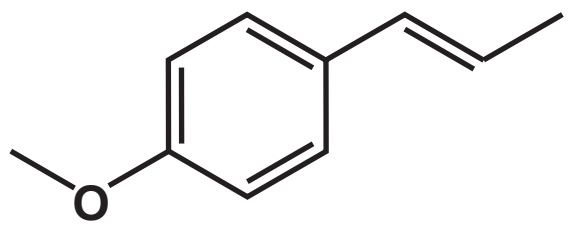
Question 8



Question 8(c)

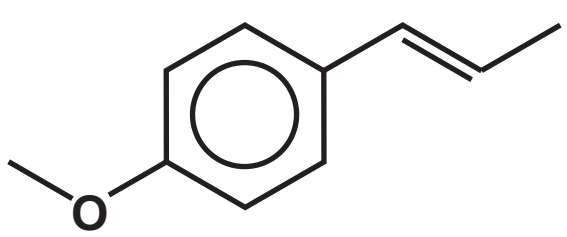


Question 8(e)

delocalised model	Kekulé structure
	

Question 8(f)

anethole



Question 9(a)(i)

Temperature (T) / K	1 / Temperature (1 / T) / K^{-1}	Rate constant (k) / $dm^3 mol^{-1} s^{-1}$	ln k
298	$3{\cdot}36 \times 10^{-3}$	$1{\cdot}36 \times 10^{-4}$	–8·9
	$3{\cdot}29 \times 10^{-3}$		–8·4
308	$3{\cdot}25 \times 10^{-3}$	$3{\cdot}04 \times 10^{-4}$	–8·1
318	$3{\cdot}14 \times 10^{-3}$	$6{\cdot}76 \times 10^{-4}$	–7·3
328	$3{\cdot}06 \times 10^{-3}$	$1{\cdot}23 \times 10^{-3}$	–6·7

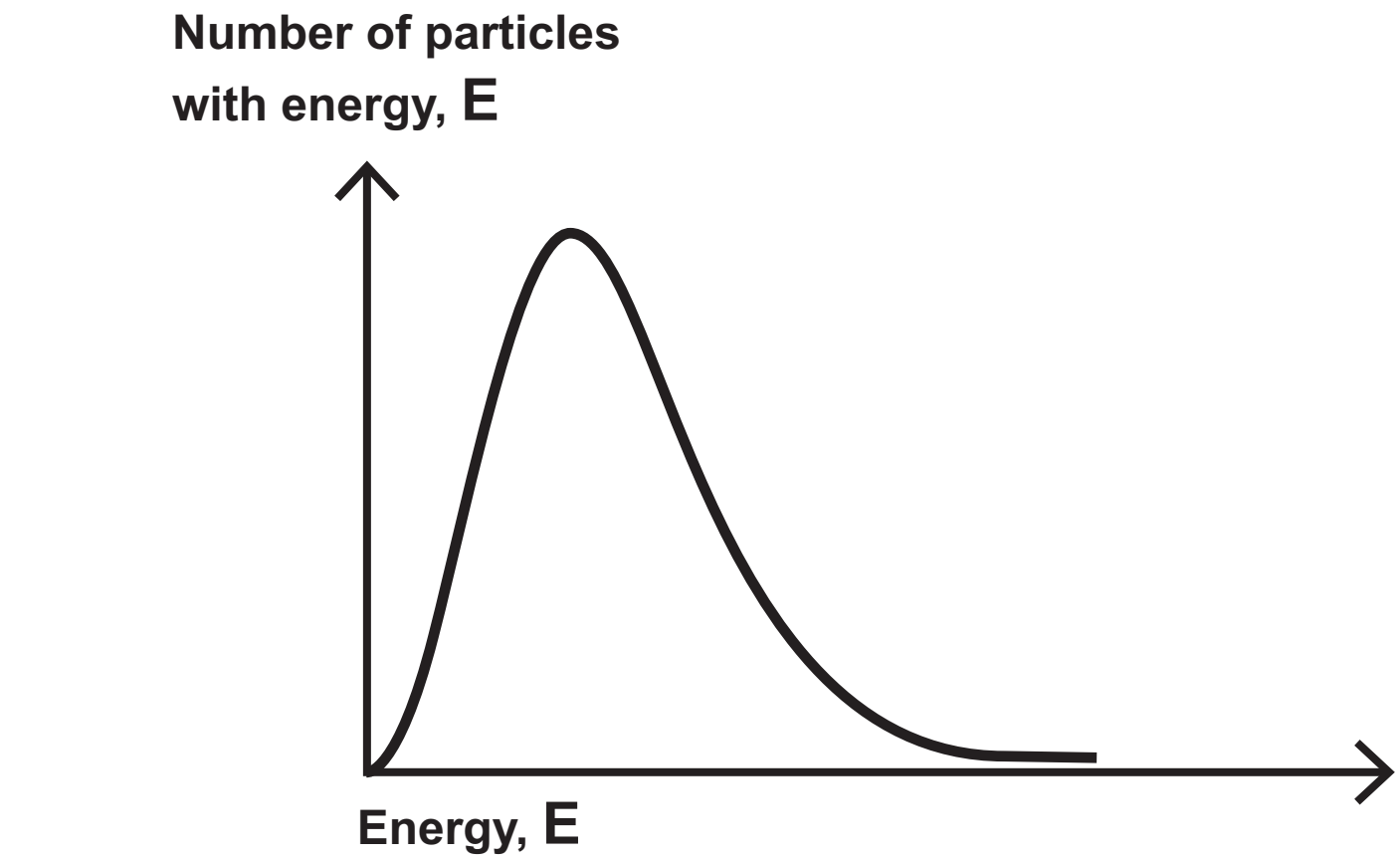
Question 9(a)(ii)

Question 4(b) – Spare copy

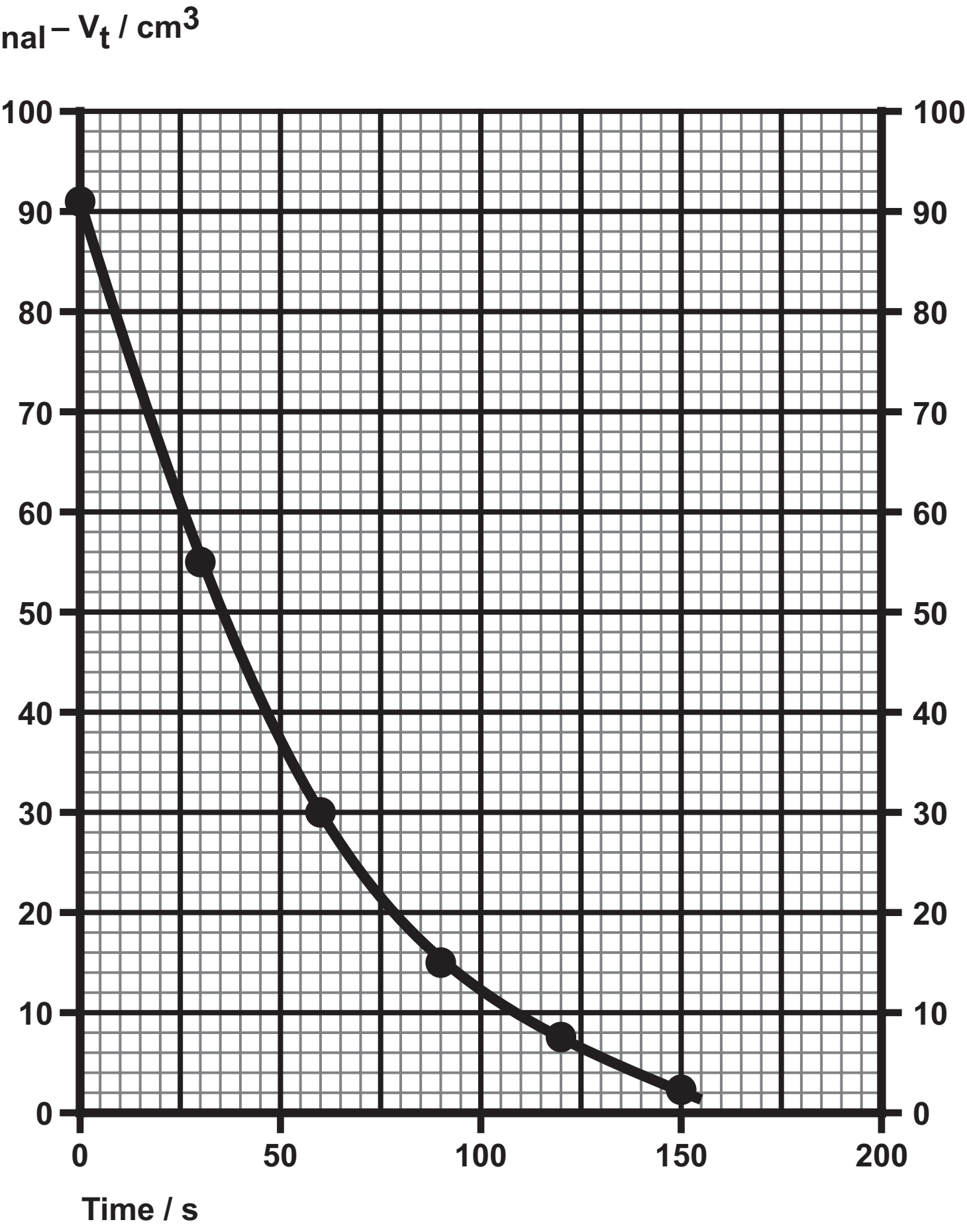
hydroxide ion

hydroxyl radical

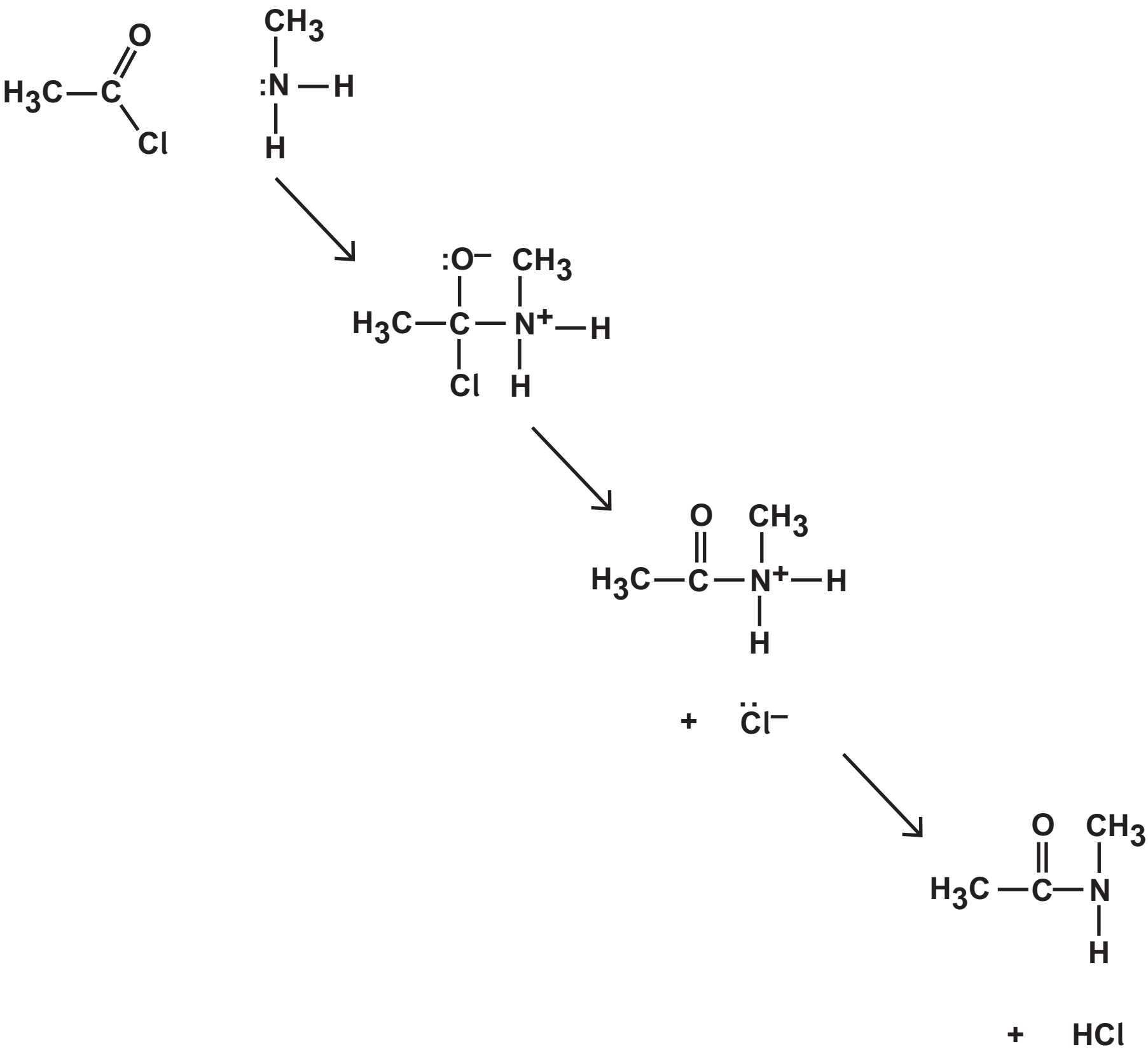
Question 5(c)(ii) – Spare copy



Question 5(d) – Spare copy



Question 7(c) – Spare copy



Question 9(a)(i) – Spare copy

Temperature (T) / K	1 / Temperature (1 / T) / K^{-1}	Rate constant (k) / $dm^3 mol^{-1} s^{-1}$	ln k
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Question 9(a)(ii) – Spare copy

