AQA A-Level Chemistry

Polymers mark scheme · goes with “Polymers” · whiteboardchemistry.com/revision/aqa-a-level-chemistry/exam-questions

Mark schemes

Polymers · 15 questions

Q1 · June 2024 · Paper 3 · Q32 · [1 mark]

Answer: **B**

A polyamide

Q2 · November 2021 · Paper 3 · Q24 · [1 mark]

Answer: **A**

Kevlar

Q3 · June 2017 · Paper 3 · Q25 · [1 mark]

Answer: **C**

Q4 · June 2018 · Paper 3 · Q21 · [1 mark]

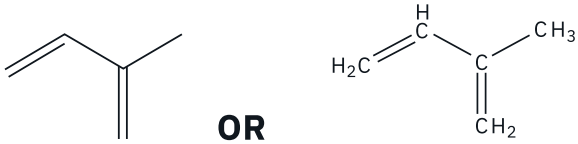
Answer: **C**

Q5 · June 2018 · Paper 3 · Q22 · [1 mark]

Answer: **B**

Q6 · June 2019 · Paper 2 · Q3 · [9 marks]

03.1



	C	H
%mass	88.2	11.8
mol	$\frac{88.2}{12}$	$\frac{11.8}{1}$
	=7.35	=11.8
÷ smaller	$\frac{7.35}{7.35}$	$\frac{11.8}{7.35}$
	= 1	1.61
x5	=5	=8

Empirical formula = molecular formula C_5H_8

M4 (must be branched)

M1 for amounts 7.35 and 11.8

M2 for process dividing M1 by smaller

M3 for answer C_5H_8 only

Allow alternatives

CH_3

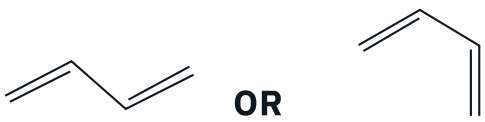
CH_2 C C

CH_3

$HC{\equiv}CCH(CH_3)_2$

[4 marks]

03.2



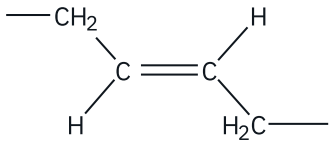
Buta-1,3-diene

Must be skeletal

M2 can only be this and is independent of M1

[2 marks]

03.3



Mark independently

Restricted rotation about the C=C or double bond

Must show trailing bonds

Ignore brackets and n

Allow skeletal – with brackets

Must be E 'trans'

Allow lack of rotation/no rotation/limited rotation

about the C=C or double bond

Ignore different groups on each carbon of the C=C

double bond

[2 marks]

03.4

Carbon Carbon bonds are non polar or (too) strong or not attacked by nucleophiles

Or

Carbon Carbon bonds cannot be hydrolysed

Allow carbon chains .....

OR

Bonds between repeating units .....

Ignore C–H bonds

[1 mark]

Q7 · June 2019 · Paper 3 · Q28 · [1 mark]

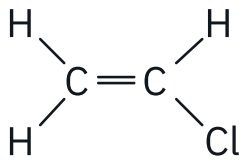
Answer: **A**

Q8 · June 2025 · Paper 2 · Q3 · [20 marks]

03.1

M1 Chloroethene

M2



Allow vinyl chloride OR chloroethylene

[2 marks]

03.2

Carbon Carbon bonds are non polar or (too) strong or not attacked by nucleophiles

Or

Carbon Carbon bonds cannot be hydrolysed

[1 mark]

03.3

(Makes the PVC) softer / more flexible

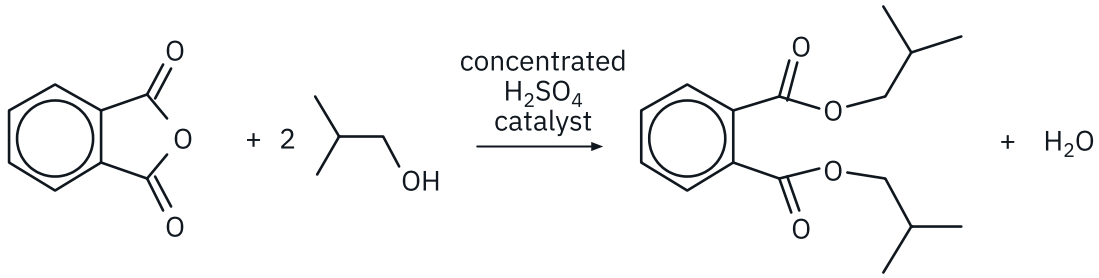
OR

Lowers the glass transition temperature

Must use comparative language

[1 mark]

03.4



DIBP

M1 either formula of alcohol or water

M2 for balanced equation

M3 (Nucleophilic) Addition–elimination

M4 $C_8H_{11}O_2$

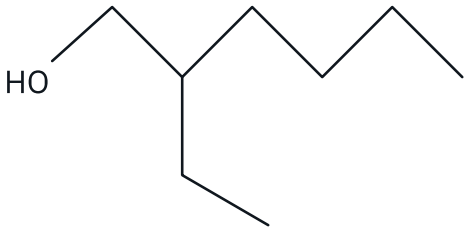
[4 marks]

03.5

2-ethylhexan-1-ol

Or suitable structural formula

eg $CH_3CH_2CH_2CH_2CH(CH_2CH_3)CH_2OH$ or



[1 mark]

03.6

M1 The more fat is present, the larger the mass DEHA (is absorbed from plastic to the food)

M2 DEHA (and oils / fats / fatty acids) contain long alkyl chains

OR DEHA is non-polar OR DEHA hydrophobic

M3 (Relatively strong / many) van der Waals' / London / dispersion forces are formed between DEHA and fats/butter

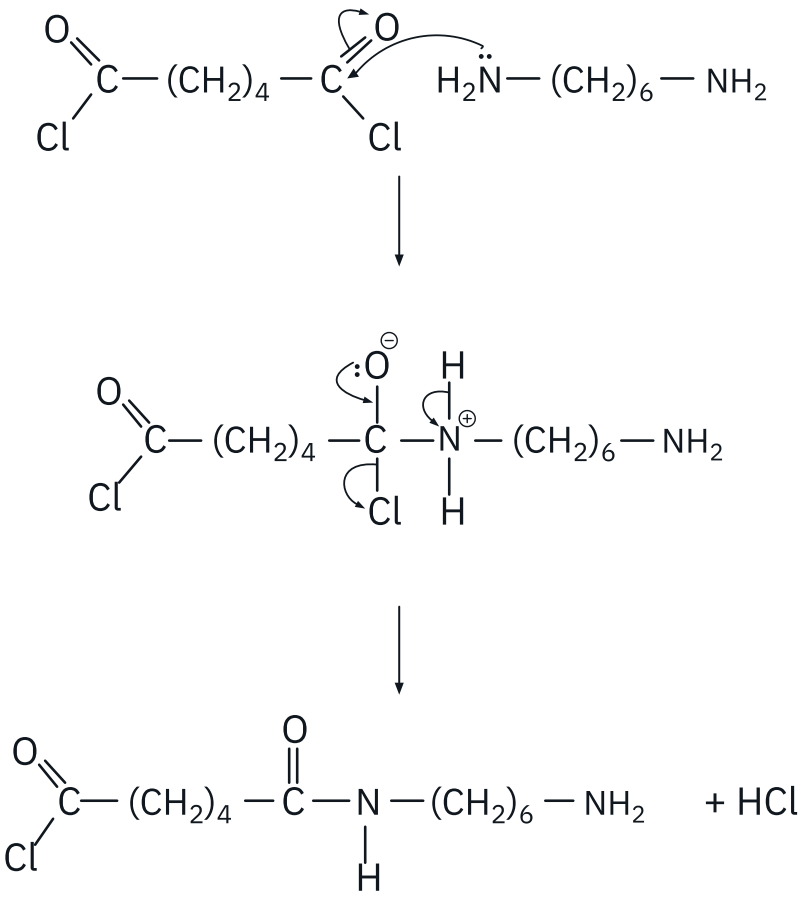
M1 allow converse for water content

M2 DEHA doesn't have any O-H (groups)

M3 Water/milk doesn't form H bonds with DEHA

[3 marks]

03.7



M1 Arrow from lone pair on N to C

M2 Arrow from C=O bond to O

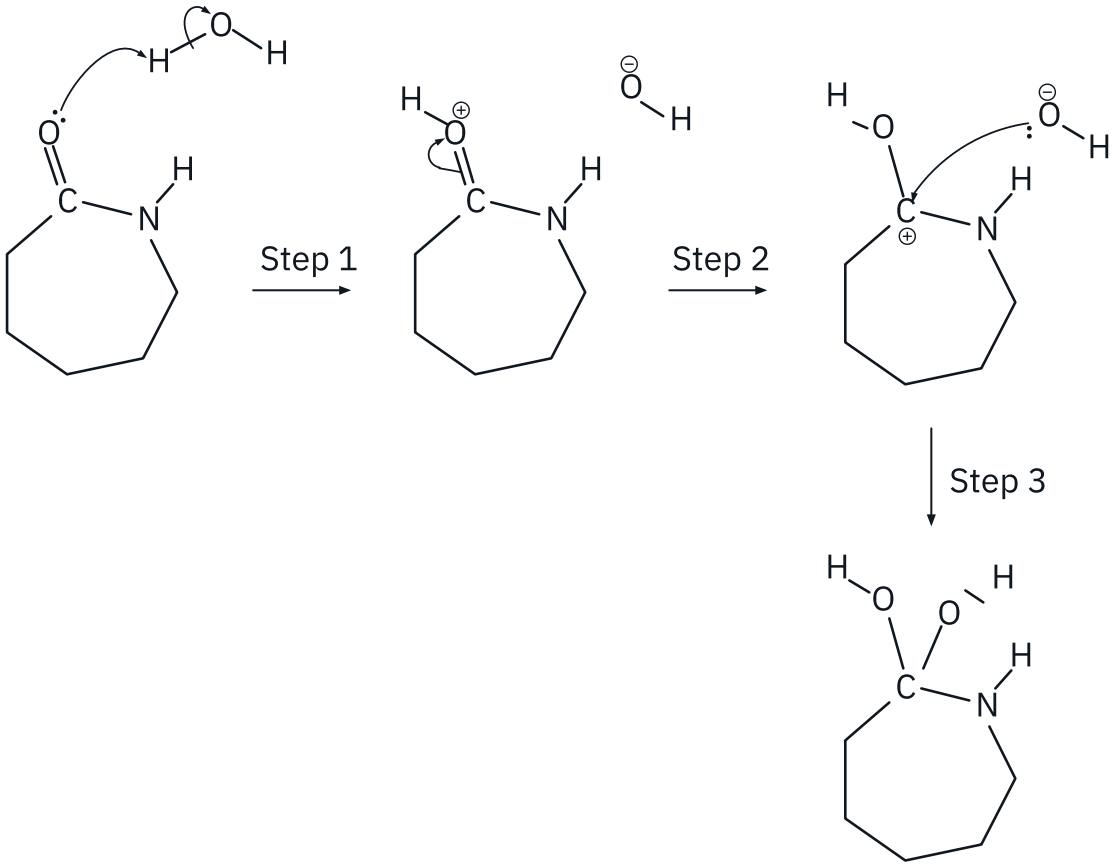
M3 Structure including –ve on O and +ve on N

M4 Three arrows;

lone pair on O to C–O bond, C–Cl bond to Cl and N–H bond to N

[4 marks]

03.8



Two arrows in step 1

M1 Arrow from lone pair on O to H

M2 Arrow from O–H bond to O

One arrow in step 2

M3 Arrow from C=O to O

One arrow in step 3

M4 Arrow from lone pair on O of $:OH^-$ to C^+

[4 marks]

Q9 · June 2024 · Paper 3 · Q28 · [1 mark]

Answer: **C**

Nylon-6,6 can be hydrolysed by aqueous sodium hydroxide.

Q10 · June 2024 · Paper 3 · Q31 · [1 mark]

Answer: **A**

Polyalkene

Q11 · June 2022 · Paper 3 · Q28 · [1 mark]

Answer: **C**

Poly(propene)

Q12 · November 2020 · Paper 3 · Q29 · [1 mark]

Answer: **A**

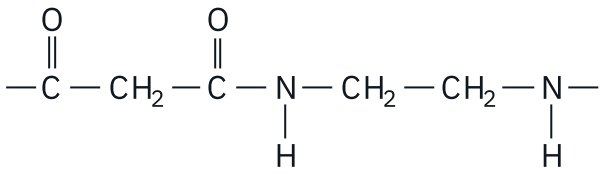
Q13 · November 2021 · Paper 3 · Q34 · [1 mark]

Answer: **A**

poly(alkene)

Q14 · November 2021 · Paper 3 · Q33 · [1 mark]

Answer: **D**



Q15 · June 2022 · Paper 3 · Q27 · [1 mark]

Answer: **A**

$H_2NCH_2CH_2NH_2$

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