

Haloalkanes (MCQ)

1. Which of the following reactions produce propan-1-ol?

- 1 The alkaline hydrolysis of 1-chloropropane.
- 2 The acid hydrolysis of propyl methanoate.
- 3 The acid hydrolysis of propanenitrile.

- A** 1, 2 and 3
B Only 1 and 2
C Only 2 and 3
D Only 1

Your answer

[1]

2. Which row describes a nucleophile?

A	electron pair donor	attracted to high electron density
B	electron pair donor	attracted to low electron density
C	electron pair acceptor	attracted to high electron density
D	electron pair acceptor	attracted to low electron density

Your answer

[1]

3. Which compound does **not** react with nucleophiles?

- A** $\text{CH}_3\text{CH}_2\text{CHO}$
B CH_3CHCH_2
C $\text{CH}_3\text{CH}_2\text{COCH}_3$
D $\text{CH}_3\text{CH}_2\text{CH}_2\text{Cl}$

Your answer

[1]

4. The breakdown of ozone is catalysed by NO radicals.

Which equation is a propagation step in the mechanism for this process?

- A** $\text{NO} + \text{O}_2 \rightarrow \text{N} + \text{O}_3$
B $\text{NO} + \text{O}_2 \rightarrow \text{NO}_2 + \text{O}$
C $\text{N} + \text{O}_3 \rightarrow \text{NO} + \text{O}_2$
D $\text{NO}_2 + \text{O} \rightarrow \text{NO} + \text{O}_2$

Your answer

[1]

5. A chemist compares the rates of hydrolysis of 1-chloropropane and 1-bromopropane in ethanol.

Which reagent in aqueous solution should be used?

- A** Silver chloride
B Silver nitrate
C Potassium chloride
D Potassium nitrate

Your answer

[1]

6. A reaction sequence is shown below:



Which type of reaction mechanism is involved in each step?

	Step 1	Step 2
A	electrophilic addition	electrophilic substitution
B	electrophilic addition	nucleophilic substitution
C	nucleophilic addition	electrophilic substitution
D	nucleophilic addition	nucleophilic substitution

Your answer

[1]

7. When heated with NaOH(aq), 1-iodobutane is hydrolysed at a much faster rate than 1-chlorobutane.

Which statement explains the different rates?

- A The C-I bond enthalpy is greater than the C-Cl bond enthalpy.
- B The C-I bond is less polar than the C-Cl bond.
- C The C-I bond has a C atom with a greater δ^+ charge than in the C-Cl bond.
- D The C-I bond requires less energy to break than the C-Cl bond.

Your answer

[1]

8. A chemist investigates the rate of hydrolysis of the haloalkanes.
Which of the following statements is / are true?

- 1: A fluoroalkane gives the slowest rate of hydrolysis.
- 2: The rate of reaction depends on the strength of the carbon-halogen bond.
- 3: The rate of reaction depends on the polarity of the carbon-halogen bond.

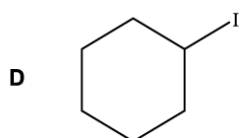
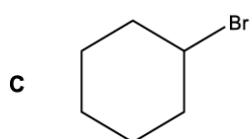
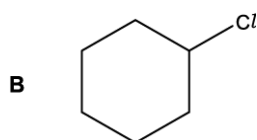
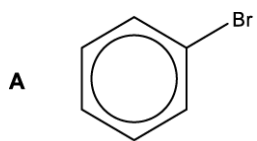
- A. 1, 2 and 3
- B. Only 1 and 2
- C. Only 2 and 3
- D. Only 1

Your answer

[1]

9. An organic compound is heated with aqueous silver nitrate and ethanol. A cream solid forms.

Which structure is most likely to be the organic compound?



Your answer

[1]

END OF QUESTION PAPER

Mark scheme – Haloalkanes (MCQ)

Question			Answer/Indicative content	Marks	Guidance
1			B	1 (AO2.3)	
			Total	1	
2			B	1 (AO1.2)	<u>Examiner's Comments</u> Many candidates correctly chose B, with A being seen as the expected main distractor. Fewer than half the candidates scored this mark.
			Total	1	
3			B	1	<u>Examiner's Comments</u> The majority of candidates identified B (an alkene) as the compound that does not react with nucleophiles.
			Total	1	
4			D	1	<u>Examiner's Comments</u> Candidates found this multiple choice question difficult. While some correctly selected D, many candidates chose B.
			Total	1	
5			B	1	<u>Examiner Comments</u> This question was answered correctly by over 90% of candidates with the most common incorrect response, silver chloride being given by those who may have named a precipitate formed in the test rather than the reagent required.
			Total	1	
6			B	1	<u>Examiner's Comments</u> Generally scored well.
			Total	1	
7			D	1	<u>Examiner's Comments</u> Generally scored well.
			Total	1	

8			B	1	
			Total	1	
9			C	1	
			Total	1	