Practice Question Set For A-Level
**Subject : Chemistry**
**Paper-2 Topic: Halogenoalkanes**

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**Name of the Student**:_____
**Max. Marks : 23 Marks** **Time : 23 Minutes**

Q1.

This question is about 2-bromopropane.

(a) Define the term electronegativity.

Explain the polarity of the C–Br bond in 2-bromopropane.

Electronegativity _____

_____

_____

Explanation _____

_____

_____

**(3)**

(b) Outline the mechanism for the reaction of 2-bromopropane with an **excess of ammonia**.

**(4)**

(c) Draw the skeletal formula of the main organic species formed in the reaction between a **large excess of 2-bromopropane** and ammonia.

Give a use for the organic product.

Skeletal formula

Use _____

**(2)**

**(Total 9 marks)**

Q2.

Bromoethane reacts with potassium cyanide to form compound D.

$$CH_3CH_2Br + KCN \rightarrow CH_3CH_2CN + KBr$$

Compound **D**

(a) Outline the mechanism for this reaction.

**(2)**

(b) Give the IUPAC name of **D**.

_____

**(1)**

(c) Calculate the percentage atom economy for the formation of **D** in this reaction.

Give your answer to the appropriate number of significant figures.

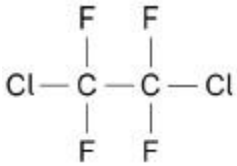
% atom economy _____

**(2)**

**(Total 5 marks)**

Q3.

The compound 1,2-dichlorotetrafluoroethane is a CFC that was previously used in refrigerators as a coolant.



(a) Molecules of 1,2-dichlorotetrafluoroethane can break down in the upper atmosphere to form chlorine radicals.

Give an equation to show the breakdown of one molecule of 1,2-dichlorotetrafluoroethane to form one chlorine radical and one other species.

_____

**(1)**

(b) Give **two** equations to show how chlorine radicals catalyse the decomposition of ozone.

_____

_____

**(2)**

(c) Butane can be used as a replacement for CFCs in refrigerators.

During its use, the butane is repeatedly converted from liquid to gas and then back to liquid. Liquid butane expands as it turns into a gas.

- Calculate the volume, in $cm^3$, of 38.8 g of butane gas at 272 K and 101 kPa (the gas constant $R$ = 8.31 J $K^{-1}$ $mol^{-1}$)
  ($M_r$ of butane = 58.0)
- Calculate the volume, in $cm^3$, of 38.8 g of liquid butane.
  (density of liquid butane = 0.60 g $cm^{-3}$)
- Use your answers to calculate the factor by which butane expands in volume when it changes from a liquid to a gas.

Show your working.

Volume of butane gas _____ $cm^3$

Volume of liquid butane _____ $cm^3$

Expansion factor _____

**(6)**

**(Total 9 marks)**