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

Merit Minds
www.merit-minds.com
Exam Preparation and Free Resources

Name of the Student:_____
Max. Marks : 26 Marks **Time : 26 Minutes**

Q1.

Tetrafluoroethene is made from chlorodifluoromethane in this reversible reaction.

$2\ CHClF_2(g) \rightleftharpoons C_2F_4(g) + 2\ HCl(g)$ $\Delta H = +128\ kJ\ mol^{-1}$

A 2.00 mol sample of $CHClF_2$ is placed in a container of volume 23.2 dm^3 and heated. When equilibrium is reached, the mixture contains 0.270 mol of $CHClF_2$

(a) Calculate the amount, in moles, of C_2F_4 and of HCl in the equilibrium mixture.

Amount of C_2F_4 _____ mol

Amount of HCl _____mol

(2)

(b) Give an expression for K_c for this equilibrium.

K_c

(1)

(c) Calculate a value for K_c

Give its units.

Downloaded from www.merit-minds.com

K_c _____ Units _____

(3)

(d) State and explain the effect of using a higher temperature on the equilibrium yield of tetrafluoroethene.

Effect on yield _____

Explanation _____

_____

_____

_____

_____

(3)

(e) Chemists provided evidence that was used to support a ban on the use of chlorodifluoromethane as a refrigerant.

Many refrigerators now use pentane as a refrigerant.

State the environmental problem that chlorodifluoromethane can cause.

Give **one** reason why pentane does not cause this problem.

Environmental problem _____

_____

Reason why pentane does not cause this problem _____

_____

_____

_____

(2)

(Total 11 marks)

Downloaded from www.merit-minds.com

Q2.

Under suitable conditions, 2-bromobutane reacts with sodium hydroxide to produce a mixture of five products, **A**, **B**, **C**, **D** and **E**.

Products **A**, **B** and **C** are alkenes.

A is a structural isomer of **B** and **C**.

A does not exhibit stereoisomerism.

B and **C** are a pair of stereoisomers.

Products **D** and **E** are alcohols.

D and **E** are a pair of enantiomers.

(a) Give the names of the **two** concurrent mechanisms responsible for the formation of the alkenes and the alcohols.

Mechanism to form alkenes _____

Mechanism to form alcohols _____

(2)

(b) Define the term stereoisomers.

_____

_____

_____

(2)

(c) Deduce the name of isomer **A**.

Explain why **A** does **not** exhibit stereoisomerism.

Name _____

Explanation _____

_____

_____

(2)

(d) Outline the mechanism for the reaction of 2-bromobutane with sodium hydroxide to form alkene **A**.

Downloaded from www.merit-minds.com

(3)

(e) Deduce the name of isomer **B** and the name of isomer **C**.

Explain the origin of the stereoisomerism in **B** and **C**.

Name _____

_____

Explanation _____

_____

_____

(2)

(f) Draw 3D representations of enantiomers **D** and **E** to show how their structures are related.

(2)

(g) A student compares the rates of hydrolysis of 1-chlorobutane, 1-bromobutane and 1-iodobutane.

The suggested method is:

- add equal volumes of the three halogenoalkanes to separate test tubes
- add equal volumes of aqueous silver nitrate to each test tube
- record the time taken for a precipitate to appear in each test tube.

State and explain the order in which precipitates appear.

Order in which precipitates appear _____

_____

_____

Explanation _____

_____

_____

_____

_____

Downloaded from www.merit-minds.com

(2)
(Total 15 marks)

Downloaded from www.merit-minds.com