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

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Name of the Student:_____
Max. Marks : 21 Marks **Time : 21 Minutes**

Q1.

(a) Dichloromethane, CH_2Cl_2, is one of the products formed when chloromethane, CH_3Cl, reacts with chlorine.

(i) Name the type of mechanism involved in this reaction and write an equation for each of the steps named below.

Name of type of mechanism _____

Initiation step

_____

First propagation step

_____

Second propagation step

_____

(ii) Write an overall equation for the formation of dichloromethane from chloromethane.

_____

(5)

(b) A compound contains 10.1% carbon and 89.9% chlorine by mass. Calculate the molecular formula of this compound, given that its relative molecular mass (M_r) is 237.0

_____

_____

_____

_____

_____

(3)

(c) Suggest the formulae of two bromine-containing organic compounds formed when dibromomethane, CH_2Br_2, reacts with bromine.

Compound 1 _____

Compound 2 _____

(2)
(Total 10 marks)

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Q2.

(a) Bromomethane, CH_3Br, can be formed by a reaction between bromine and methane.

The mechanism for this reaction is similar to the mechanism for the chlorination of methane.

(i) Name the mechanism for this reaction.

_____

(ii) Give the name of, and state an essential condition for, the first step in the mechanism for this reaction.

Name _____

Essential condition _____

(iii) Write an equation for a termination step in the mechanism for this reaction which gives ethane as a product.

_____

(iv) Bromomethane can undergo further substitution. Write an overall equation for the reaction between bromomethane and bromine in which dibromomethane is formed.

_____

(5)

(b) Bromomethane reacts with the nucleophile ammonia according to the following equation.

$CH_3Br + 2NH_3 \rightarrow CH_3NH_2 + NH_4Br$

(i) Explain what is meant by the term *nucleophile*.

_____

_____

(ii) Name the organic product of this reaction.

_____

(iii) Outline a mechanism for this reaction.

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(6)

(Total 11 marks)

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