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

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

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

Q1.

When chlorine reacts with trichloromethane, tetrachloromethane, CCl_4, is formed.

(a) (i) Write the overall equation for this reaction.

_____

(ii) State **one** essential condition for this reaction.

_____

(2)

(b) The mechanism for the chlorination of trichloromethane is free-radical substitution, which proceeds by a series of steps. Write equations for the steps named below in this chlorination.

Initiation step

_____

First propagation step

_____

Second propagation step

_____

A termination step

_____

(4)
(Total 6 marks)

Downloaded from www.merit-minds.com

Q2.

The burning of fossil fuels can produce atmospheric pollutants.

(a) The combustion of petrol in an internal combustion engine can lead to the formation of carbon monoxide, CO, and nitrogen monoxide, NO.

(i) Write an equation for the incomplete combustion of octane, C_8H_{18}, to produce CO and water only.

_____

(ii) State **one** essential condition for the formation of NO in an engine. Write an equation for the reaction in which NO is formed.

Condition _____

Equation _____

(3)

(b) All new petrol-engined cars must be fitted with a catalytic converter.

(i) Name **one** of the metals used as a catalyst in a catalytic converter.

_____

(ii) Write an equation to show how CO and NO react with each other in a catalytic converter.

_____

(2)

(c) State why sulphur dioxide gas is sometimes found in the exhaust gases of petrol-engined cars. Give **one** adverse effect of sulphur dioxide on the environment.

Reason for SO_2 in exhaust gases _____

_____

Environmental effect of SO_2 _____

_____

(2)

(Total 7 marks)

Downloaded from www.merit-minds.com

Q3.

(a) (i) Name the process used to separate petroleum into fractions.

_____

(ii) Give the molecular formula for an alkane with nine carbon atoms.

_____

_____

(iii) Write an equation for the complete combustion of the alkane $C_{11}H_{24}$

_____

(iv) Write an equation for the incomplete combustion of $C_{11}H_{24}$ to produce carbon and water only.

_____

(4)

(b) Alkenes can be produced by cracking the naphtha fraction obtained from petroleum.

(i) Write an equation for the thermal cracking of one molecule of $C_{10}H_{22}$ to give one molecule of propene and one molecule of an alkane only.

_____

(ii) Draw the structure of the chain isomer of but-1-ene.

(2)

(c) The alkanes and the alkenes are examples of homologous series of compounds. One feature of an homologous series is the gradual change in physical properties as the relative molecular mass increases. State **two** other general features of an homologous series of compounds.

Feature 1 _____

_____

Feature 2 _____

_____

(2)

(Total 8 marks)

Downloaded from www.merit-minds.com