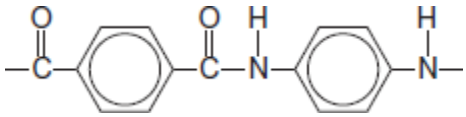
Practice Question Set For A-Level
Subject : Chemistry
Paper-2 Topic: Aromatic Chemistry

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Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 Minutes**

Q1.

Kevlar is a polymer used in protective clothing.
The repeating unit within the polymer chains of Kevlar is shown.

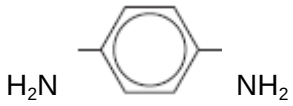


(a) Name the strongest type of interaction between polymer chains of Kevlar.

_____

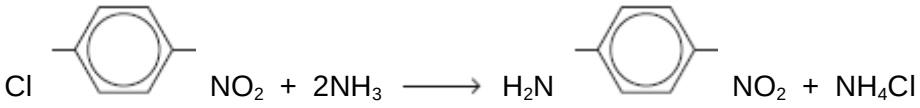
(1)

(b) One of the monomers used in the synthesis of Kevlar is



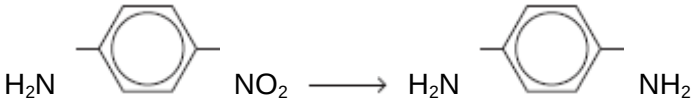
An industrial synthesis of this monomer uses the following two-stage process starting from compound **X**.

Stage **1**



X

Stage **2**



(i) Suggest why the reaction of ammonia with **X** in Stage **1** might be considered unexpected.

_____

_____

_____

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_____

(2)

(ii) Suggest a combination of reagents for the reaction in Stage **2**.

_____

(1)

(iii) Compound **X** can be produced by nitration of chlorobenzene.

Give the combination of reagents for this nitration of chlorobenzene.
Write an equation or equations to show the formation of a reactive intermediate from these reagents.

Reagents _____

_____

Equation(s) _____

_____

(3)

(iv) Name and outline a mechanism for the formation of **X** from chlorobenzene and the reactive intermediate in part (iii).

Name of mechanism _____

Mechanism

(4)
(Total 11 marks)

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Q2.

This question is about acylium ions, $[RCO]^+$

(a) The acylium ion $H_3C-\overset{+}{C}=O$ is formed in a mass spectrometer by fragmentation of the molecular ion of methyl ethanoate.

Write an equation for this fragmentation.

Include in your answer a displayed formula for the radical formed.

_____

(2)

(b) The acylium ion $H_3C-\overset{+}{C}=O$ can also be formed from ethanoyl chloride. The ion reacts with benzene to form $C_6H_5COCH_3$

(i) Write an equation to show the formation of this acylium ion by the reaction of ethanoyl chloride with **one** other substance.

_____

(2)

(ii) Name and outline a mechanism for the reaction of benzene with this acylium ion.

Name of mechanism _____

Mechanism

(4)

(iii) Ethanoic anhydride also reacts with benzene to form $C_6H_5COCH_3$

Write an equation for this reaction.

_____

(1)

(Total 9 marks)

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