CHEMISTRY ONLINE
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CHEMISTRY

INORGANIC CHEMISTRY II

Level & Board	AQA (A-LEVEL)
TOPIC:	ALDEHYDES AND KETONES
PAPER TYPE:	SOLUTION - 3
TOTAL QUESTIONS	10
TOTAL MARKS	33

Aldehydes and Ketones – 3

1.

Triglycerides are soluble in nonpolar solvents due to following factors:

- Van der Waals interactions exist between triglycerides themselves.

  The long hydrocarbon chains of triglycerides can interact with each other through these weak intermolecular forces.

- Van der Waals forces also occur between triglycerides and the nonpolar solvent.

  The nonpolar nature of the solvent allows for favorable interactions with the hydrophobic hydrocarbon chains of triglycerides.

Triglycerides are insoluble in water:

- Triglycerides **cannot form hydrogen bonds with water** molecules to a significant extent.

- The hydrocarbon chains of triglycerides lack suitable sites, such as oxygen atoms, for hydrogen bonding.

- Additionally, the presence of long hydrocarbon chains would interfere with the hydrogen bonding network of water molecules.

(3)

2. **C**

(1)

3.

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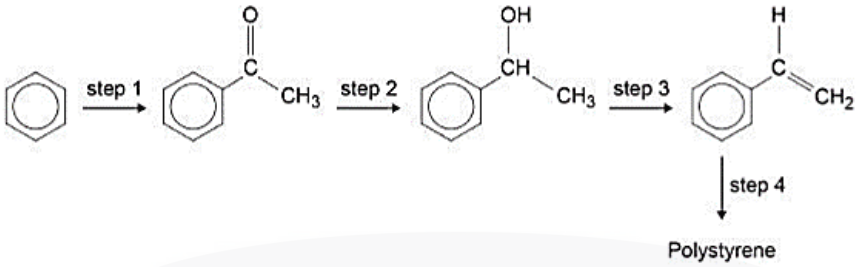
(a)



Type of reaction: *Acylation*

The reagent required is an acyl chloride such as CH_3COCl or ethanoyl chloride.

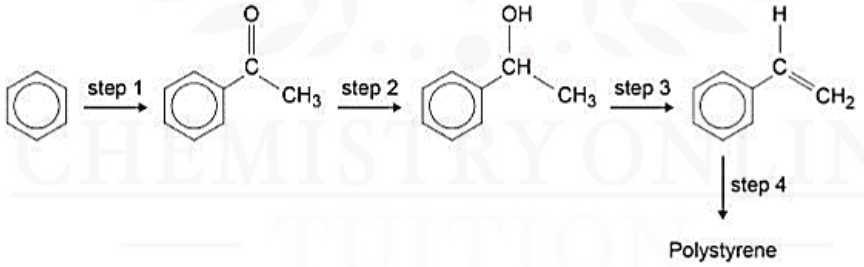
The conditions for the reaction involve the use of a Lewis acid catalyst, such as $AlCl_3$.

So, for step 1, the reagent is CH_3COCl, and the catalyst is $AlCl_3$.

(3)

(b)

For step 2.



Name of the mechanism:

Nucleophilic addition

Inorganic reagent: *$NaBH_4$*

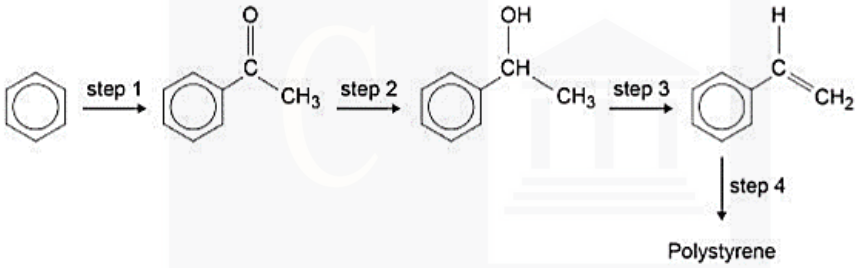
This compound is commonly used as a reducing agent in organic chemistry reactions.

Name of organic product:

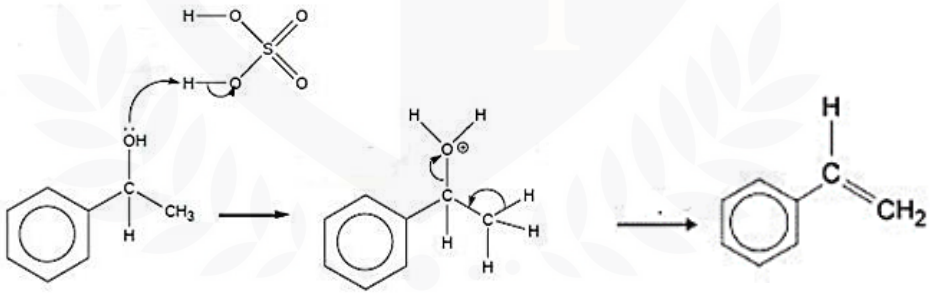
1-phenyl ethan(-1-)ol

(3)

(c)



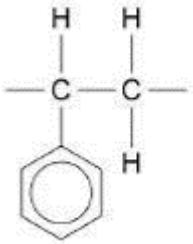
The mechanism for step 3:



(3)

(d)

Repeating unit of polystyrene:



(1)

4. A

(1)

5.

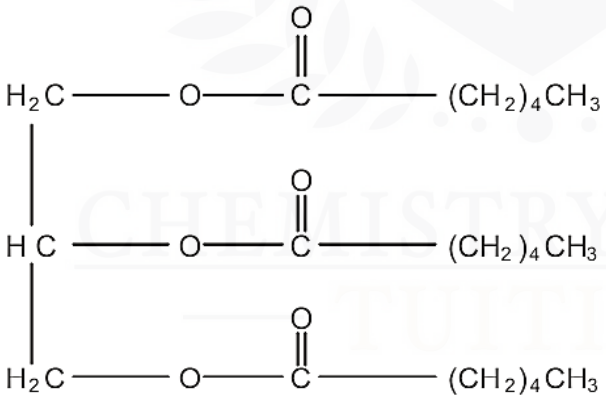
Complete the equation for the reaction is given below.

$Cl_3CCH(OH)_2 + [O] \rightarrow CCl_3COOH + H_2O$

(1)

6.

Structure of glyceryl trihexanoate:



(2)

7.

(a)

Esters are used in food manufacturing for their flavoring properties, particularly their fruity smells and tastes, which enhance the sensory appeal of products like chewing gum and desserts.

(1)

(b)

Condition:

Concentrated H_2SO_4 with reflux or distillation.

(2)

(c)

Complete the equation for the formation of ester 2 is following:

$CH_3COOH + C_9H_{15}CH2OH \rightarrow CH_3COOCH_2C_9H_{15} + H_2O$

(2)

8.

(a)

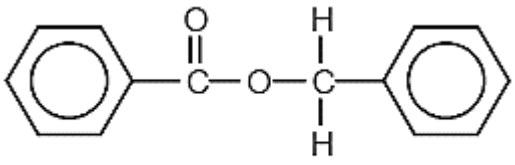
H^+ / H_2SO_4 can be a suitable catalyst for this reaction.

(1)

(b)

Benzoic acid and phenylmethanol will react to produce organic product.

Following is the displayed formula of the organic product. (Ester)

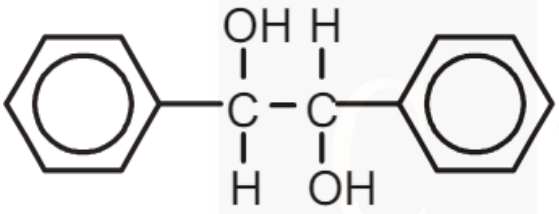


(2)

9.

(a)

Following is the displayed formula of the organic product (Hydrobenzoin) that would be formed by reducing diphenylethanedione with excess $NaBH_4$:



Name: Hydrobenzoin

(1)

(b)

Balance the equation for the reaction can be written as:

$C_{14}H_{10}O_2 + 4[H] \rightarrow C_{14}H_{14}O_2$

(1)

10.

For following conversion.:

The **reducing agent can be** for this conversion either Sn (tin) with HCl or Fe (iron) with HCl.

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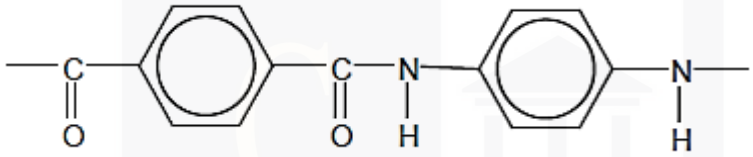
The **balanced equation** for the reaction, using molecular formulae:

$C_6H_4N_2O_4 + 12[H] \rightarrow C_6H_8N_2 + 4H_2O$

The product formed is $C_6H_8N_2$, which is a cyclic compound given the starting material.

The **repeating unit** of the polymer formed by the product of this reaction with benzene-1,4-dicarboxylic acid involves following units:



(5)

I am Sorry !!!!!

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