

Name of the Student: _____

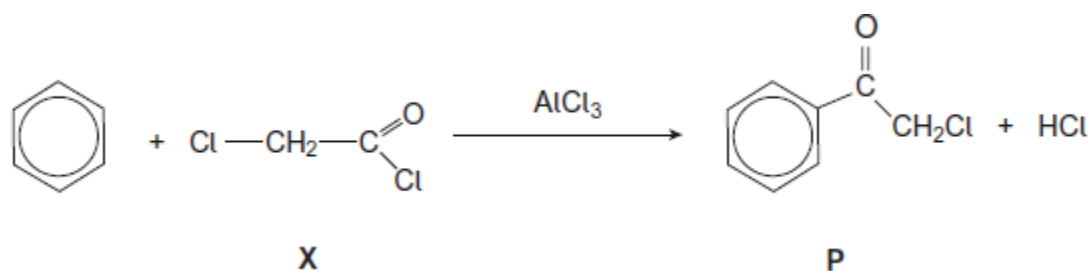
Max. Marks : 24 Marks

Time : 24 Minutes

Q1.

Compound **X** (ClCH_2COCl) is used as a reagent in organic synthesis.

- (a) One important reaction of
- X**
- is in the preparation of compound
- P**
- as shown.



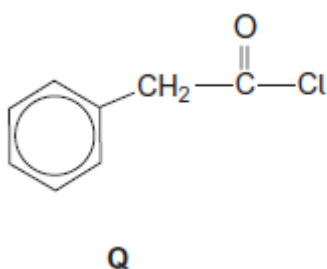
- (i) Draw the structure of the electrophile formed by the reaction of
- X**
- with
- AlCl_3
- .

(1)

- (ii) Outline the mechanism for the reaction of the electrophile from part (a)(i) with benzene in the preparation of
- P**
- .

(3)

- (b) Compound
- Q**
- is an alternative product that could be formed when
- X**
- reacts with benzene.



Describe how you could distinguish between **P** and **Q** by a test-tube reaction.
Give the reagent used and the observation with each compound.

Reagent _____

Observation with **P** _____

Observation with **Q** _____

(3)

- (c) **X** is also used to make the compound HOCH_2COOH . This compound is polymerised to form the polymer known as PGA. PGA is used in surgical sutures (stitches).

(i) Draw the repeating unit of PGA.

(1)

- (ii) Production of PGA occurs via a cyclic compound. Two HOCH_2COOH molecules react together to form the cyclic compound and two molecules of water.

Draw the structure of this cyclic compound.

(1)

- (d) Poly(propene) is also used in surgical sutures.

(i) Draw the repeating unit of poly(propene).

(1)

- (ii) Suggest an advantage of surgical sutures made from PGA rather than from poly(propene).
Explain your answer.

(2)

(Total 12 marks)

Q2.

The following pairs of compounds can be distinguished by simple test-tube reactions.

For each pair of compounds, give a reagent (or combination of reagents) that, when added separately to each compound, could be used to distinguish between them.

State what is observed in each case.

- (a) Butan-2-ol and 2-methylpropan-2-ol

Reagent _____

Observation with butan-2-ol

Observation with 2-methylpropan-2-ol

(3)

- (b) Propane and propene

Reagent _____

Observation with propane

Observation with propene

(3)

- (c) Aqueous silver nitrate and aqueous sodium nitrate

Reagent _____

Observation with aqueous silver nitrate

Observation with aqueous sodium nitrate

(3)

- (d) Aqueous magnesium chloride and aqueous barium chloride

Reagent _____

Observation with aqueous magnesium chloride

Observation with aqueous barium chloride

(3)

(Total 12 marks)