



A-Level Chemistry

Aromatic (Multiple Choice)

Question Paper

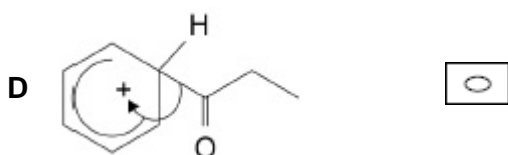
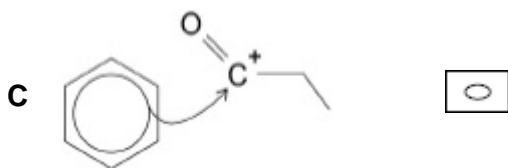
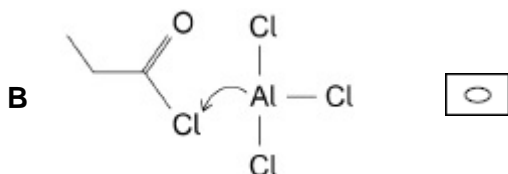
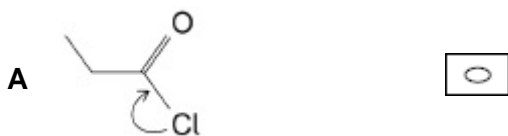
Time available: 13 minutes
Marks available: 12 marks

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1.

The reaction between propanoyl chloride and benzene is an example of acylation.

Which is a correct representation of part of the mechanism of this reaction?



(Total 1 mark)

2.

The nitration of benzene uses a nitrating mixture of concentrated nitric acid and concentrated sulfuric acid.



Which statement is correct?

A HNO_3 acts as a base.

B HNO_3 acts as a catalyst.

C HNO_3 acts as an electrophile.

D HNO_3 acts as a reducing agent.

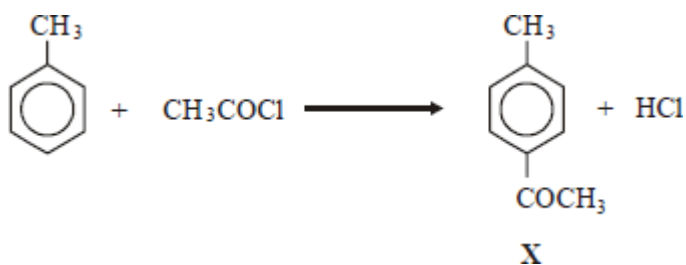
(Total 1 mark)

3. Use your understanding of the bonding in benzene to identify the compound that has the most exothermic enthalpy of hydrogenation.



(Total 1 mark)

4. Ethanoyl chloride reacts with methylbenzene forming compound X according to the equation below.



If the experimental yield is 40.0%, the mass in grams of X ($M_r = 134.0$) formed from 18.4 g of methylbenzene ($M_r = 92.0$) is

- A 26.8
- B 16.1
- C 10.7
- D 7.4

(Total 1 mark)

5. In a reaction which gave a 27.0% yield, 5.00 g of methylbenzene were converted into the explosive 2,4,6-trinitromethylbenzene (TNT) ($M_r = 227.0$). The mass of TNT formed was

- A 1.35 g
- B 3.33 g
- C 3.65 g
- D 12.34 g

(Total 1 mark)

6. 1,3-dinitrobenzene can be prepared by heating nitrobenzene with a mixture of fuming nitric acid and concentrated sulphuric acid. The reaction can be represented by the following equation.

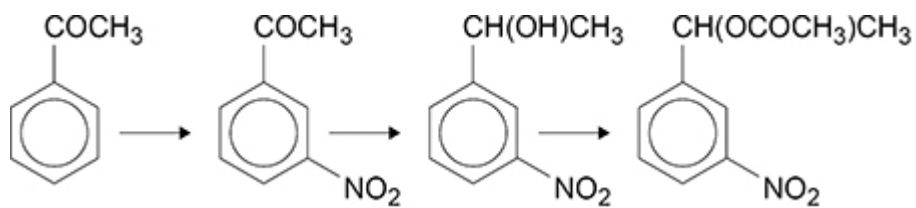


If the yield of the reaction is 55%, the mass of 1,3-dinitrobenzene produced from 12.30 g of nitrobenzene is

- A 16.90 g
- B 16.80 g
- C 9.30 g
- D 9.24 g

(Total 1 mark)

7.



Which type of reaction is **not** involved in this reaction sequence?

- A esterification
- B hydrolysis
- C nitration
- D reduction

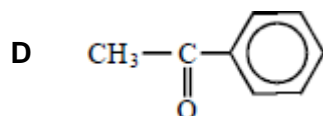
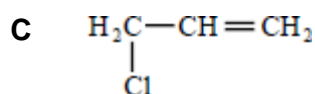
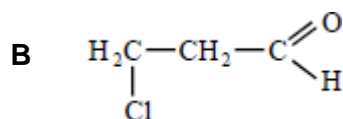
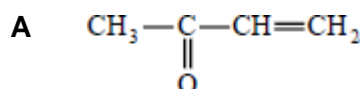
(Total 1 mark)

8. Which one of the following does **not** contain any delocalised electrons?

- A poly(propene)
- B benzene
- C graphite
- D sodium

(Total 1 mark)

9. Which one of the following can react both by nucleophilic addition and by nucleophilic substitution?



(Total 1 mark)

10. The relative molecular mass (M_r) of benzene-1,4-dicarboxylic acid is

- A 164
- B 166
- C 168
- D 170

(Total 1 mark)

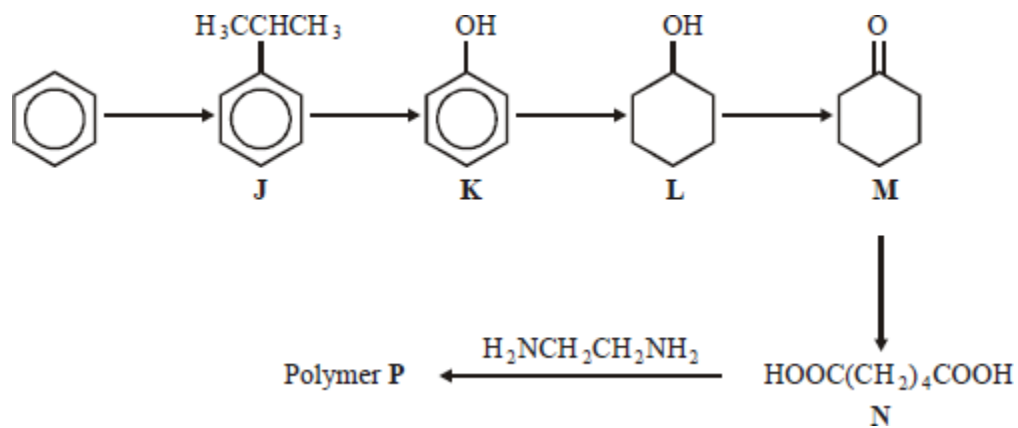
11. In which one of the following reactions is the role of the reagent stated correctly?

	Reaction	Role of reagent
A	$\text{TiO}_2 + 2\text{C} + 2\text{Cl}_2 \rightarrow \text{TiCl}_4 + 2\text{CO}$	TiO_2 is an oxidising agent
B	$\text{HNO}_3 + \text{H}_2\text{SO}_4 \rightarrow \text{H}_2\text{NO}_3^+ + \text{HSO}_4^-$	HNO_3 is a Brønsted-Lowry acid
C	$\text{CH}_3\text{COCl} + \text{AlCl}_3 \rightarrow \text{CH}_3\text{CO}^+ + \text{AlCl}_4^-$	AlCl_3 is a Lewis base
D	$2\text{CO} + 2\text{NO} \rightarrow 2\text{CO}_2 + \text{N}_2$	CO is a reducing agent

(Total 1 mark)

12.

This question is about the following reaction scheme which shows the preparation of polymer **P**.



If 1.0 kg of benzene gave 0.98 kg of **J**, the percentage yield of **J** was

- A 64
- B 66
- C 68
- D 70

(Total 1 mark)