

# Aromatics

## Question Paper

Level	Pre U
Subject	Chemistry
Exam Board	Cambridge International Examinations
Topic	Aromatics- Aromatic chemistry
Booklet	Question Paper

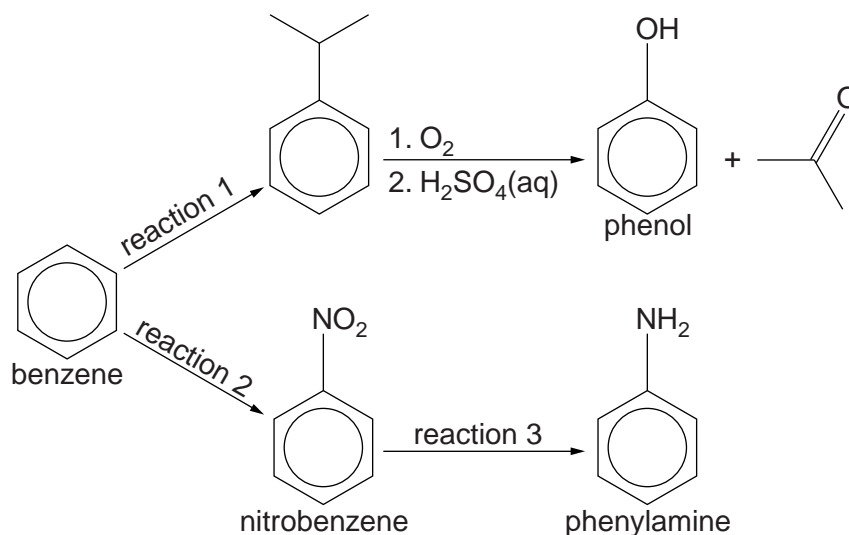
**Time Allowed:** 26 minutes

**Score:** /22

**Percentage:** /100

**Grade Boundaries:**

1. Some reactions starting from benzene,  $C_6H_6$ , are shown.



- (a) (i) Reactions 1 and 2 both proceed by electrophilic substitution.

Give the names of the reagent(s) needed, catalyst used and the identity of the electrophile in each case.

**Reaction 1**

reagent(s) .....

catalyst .....

electrophile .....

**Reaction 2**

reagent(s) .....

catalyst .....

electrophile ..... [6]

- (ii) For reaction 3, state the type of reaction undergone by nitrobenzene and the reagents needed.

reaction type .....

reagents ..... [2]

**(b)** Phenol reacts readily with bromine water at room temperature, whereas nitrobenzene does not react with bromine water under these conditions.

**(i)** State what would be observed on addition of bromine water to phenol until in excess.

.....  
.....[2]

**(ii)** Give the equation for the reaction between excess bromine and phenol.

.....[2]

**(iii)** Explain why phenol is brominated under these conditions whereas nitrobenzene is not.

.....  
.....  
.....  
.....  
.....  
.....[4]

**(c)** The  $pK_a$  for phenol is about 10 while the value for ethanol is about 16.

Explain the relative magnitudes of these values.

.....  
.....  
.....[2]

**(d) (i)** Write an equation for the reaction of phenylamine with hydrochloric acid.

.....[1]

**(ii)** State and explain the relative basicities of ammonia, ethylamine and phenylamine.

.....  
.....  
.....  
.....[3]

[Total: 22]