Paddington Academy
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A2 LEVEL CHEMISTRY

4.1.1 ARENES

TEST

Answer all questions

Max 28 marks

Name	……
Mark	……../28 ……..% Grade ……

1. In this question, one mark is available for the quality of spelling, punctuation and grammar.

Describe with the aid of suitable diagrams the bonding and structure of a benzene molecule.

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[6]

Quality of Written Communication [1]

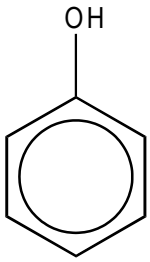
[Total 7 marks]

2. Complete the reactions by drawing structural formulae in each of the boxes provided.

(i) C_6H_6 $\xrightarrow[\text{heat}]{\text{conc. } H_2SO_4 \text{ and conc. } HNO_3}$ [ ]

[1]

(ii)



$\xrightarrow[\text{room temperature}]{Br_2}$ [ ]

[1]

[Total 2 marks]

3. (a) In this question, one mark is available for the quality of use and organisation of technical terms.

Bromine is used in organic chemistry to carry out a variety of electrophilic reactions.

(i) Describe and explain how a molecule of bromine acts as an electrophile. Illustrate your answer with a diagram showing relevant dipoles and curly arrows.

(ii) Use your answer to (i) to explain why bromine reacts much more readily with cyclohexene than it does with benzene.

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[7]

Quality of Written Communication [1]

(b) The compound iodine monobromide, IBr, also reacts with benzene in an electrophilic reaction.

(i) Which compound would be the main product of this reaction, iodobenzene or bromobenzene? Explain your answer.

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[2]

(ii) Deduce an equation for the reaction of iodine monobromide with benzene.

[1]

[Total 11 marks]

4. In this question, one mark is available for the quality of use and organisation of scientific terms.

Describe how benzene could be converted into nitrobenzene.

State the reagents and conditions, give a balanced equation for each stage and show the structure of the product.

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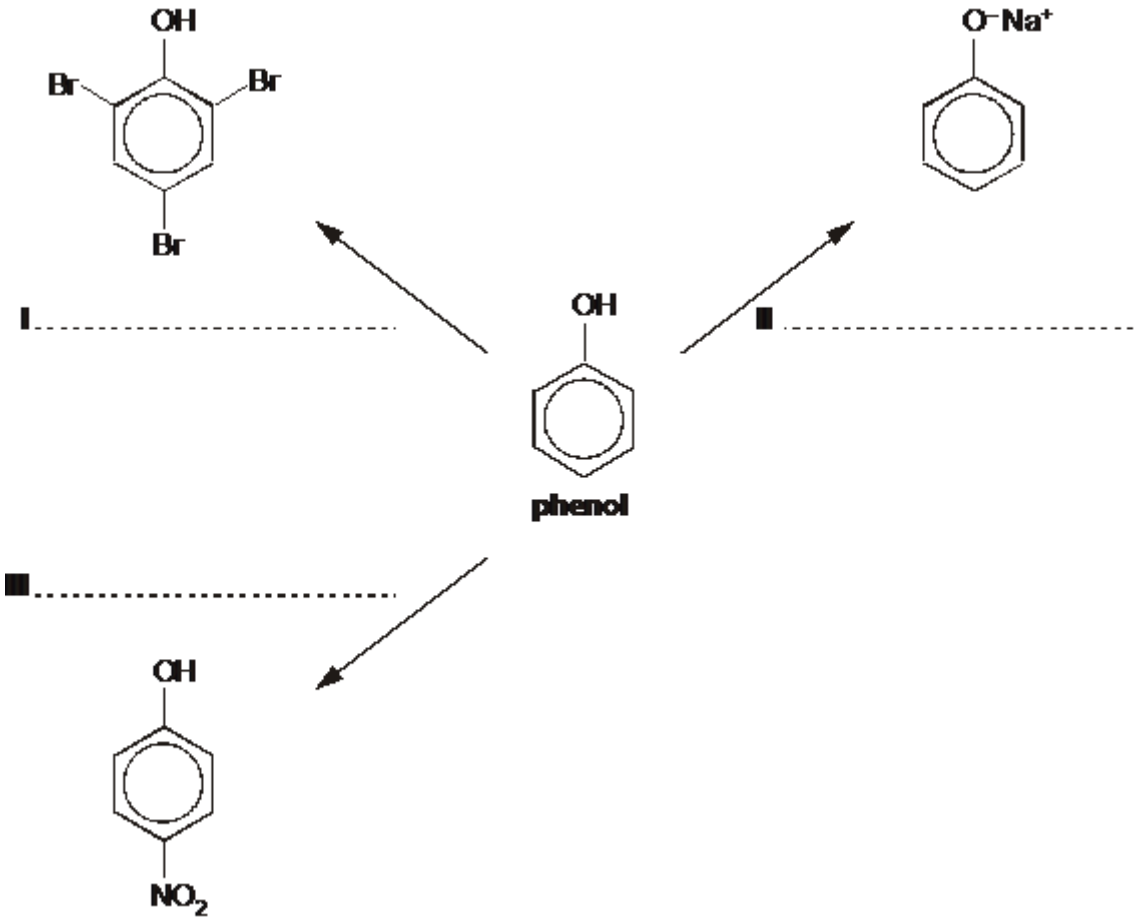
Quality of Written Communication [1]

[Total 5 marks]

5. The diagram below shows some reactions of phenol.



On the diagram above, identify suitable reagents that could be used to carry out reactions **I**, **II** and **III**.

[Total 3 marks]