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**OCR A2 CHEMISTRY**

**UNIT 4 MODULE 1**

**ASSESSMENT POINT 1**

**39 MINUTES**

**31 MARKS**

Answer all the questions.

1 Benzene and phenol are used in the chemical and pharmaceutical industry as starting materials for making more complex aromatic compounds.

(a) Benzene can be nitrated to form nitrobenzene,  $C_6H_5NO_2$ .

(i) State the reagents and conditions needed for the nitration of benzene.

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

(ii) An electrophile is formed during the nitration of benzene.

What is the formula of the electrophile?

..... [1]

(iii) Write an equation for the production of the electrophile.

..... [1]

(iv) Describe, with the aid of curly arrows, the mechanism for the nitration of benzene.

[4]

(v) 3.9g of benzene were nitrated to give 4.9g of nitrobenzene.

Calculate the percentage yield. Give your answer to **two** significant figures.

[3]





- (iii) In the boxes below, draw the structures of a phenol and an amine that could have been used to make **E103** by the method described in (a).

phenol	amine
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[2]

- (c) **E103** can also be used as an acid-base indicator. At high pH, **E103** turns red.

Suggest the structure of **E103** at high pH.

[1]

[Total: 11]