

A Level Chemistry B (Salters)
H433/01 Fundamentals of chemistry

Question Set 15

- 1 (a) Some students have two isomeric compounds **A** and **B** with the molecular formula $C_9H_{10}O$. They are both used in the perfume industry.

The students do some tests to find out which functional groups are present.

They look at the formulae and decide that the molecules are probably unsaturated due to the low proportion of hydrogen.

They test each compound with bromine water.

Both compounds **A** and **B** show a positive result with bromine water.

Describe the colour **change** the students would see in the reaction. [1]

- 1 (b) They then decide that the molecules could be aromatic.

What does aromatic mean? [1]

- 1 (c) Compound **A** contains a phenol group.

How do the students identify the phenol group?

Test:

Expected result: [1]

- 1 (d) (i) The students suspect that compound **B** contains an alcohol group and they want to find out what type of alcohol it is. They decide to see if compound **B** can be oxidised and if so whether the product is an aldehyde or a ketone.

They find that compound **B** is a primary alcohol.

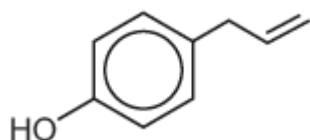
Fill in the table to show the reagents, conditions and colour changes for their tests.

	Reagent(s)	Conditions	Colour change
Oxidation of alcohol			
Identification of aldehyde or ketone			

[3]

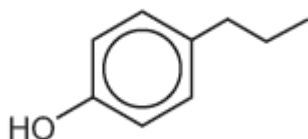
- 1 (d) (ii) Draw a **skeletal** formula for the **unsaturated** aromatic compound **B**. [1]

- 1 (e) (i) The students are told that the structure of compound **A** is as shown below.



Other organic products can be made from compound **A**.

Give the reagent and conditions to convert compound **A** into the compound shown below.



Reagent

Conditions

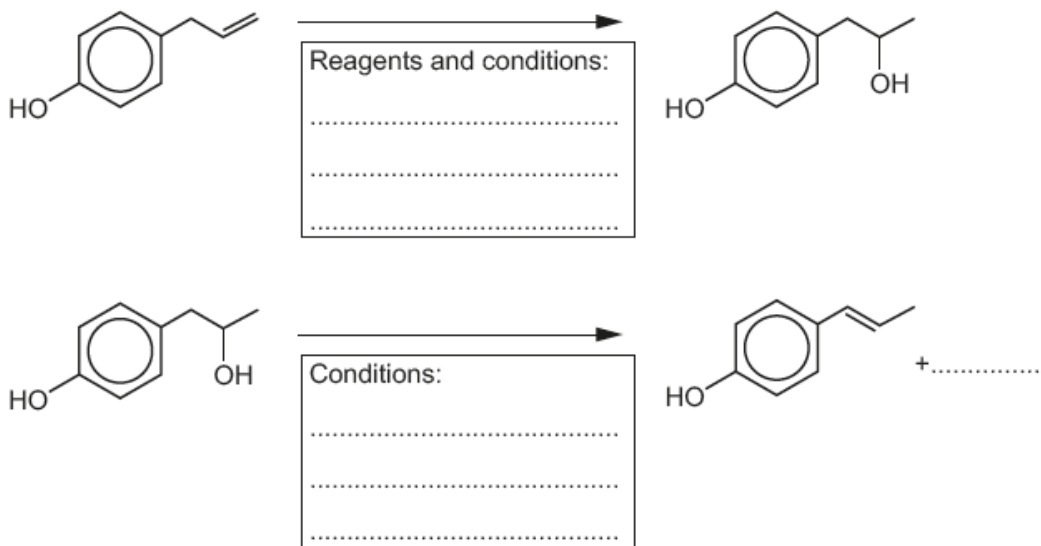
[1]

- 1 (e) (ii) The students want to make the ethanoate ester of compound **A**.

Give the equation for a reaction to do this.
Use structural formulae for the organic molecules.

[2]

- 1 (f) (i) One of the students suggests the method below to change the position of the double bond on the side chain in two steps.



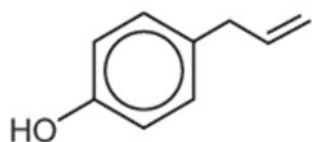
Complete the reaction sequence by writing on the dotted lines.

[2]

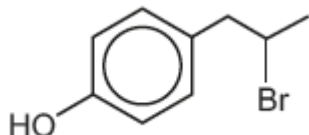
- 1 (f) (ii) Comment on the student's method of changing the position of the double bond.

[2]

1 (g) (i) Compound **A** is repeated below.



Hydrogen bromide reacts with compound **A** to give the compound shown below.



Show the mechanism of the reaction of compound **A** with hydrogen bromide.

Use curly arrows and partial and full charges where appropriate.

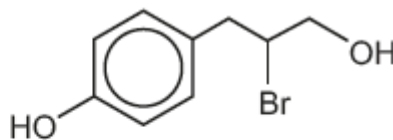
[2]

1 (g) (ii) Compound **A** is reacted with aqueous hydrogen bromide containing dissolved sodium chloride.

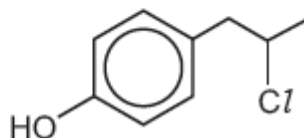
A student suggests that the products shown below are formed in addition to the product in part (i).

Comment on whether the student's suggestions are correct, giving the chemistry involved.

Product 1



Product 2



[3]

Total Marks for Question Set 15: 19

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