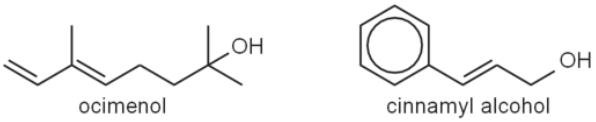
A level Chemistry B

H433/03 Practical skills in chemistry

Question Set 3

1 (a) A perfume laboratory is investigating the molecules responsible for the smell of some commonflowers.

Their investigations suggest that the following two liquid compounds are important in thecharacteristic smell of hyacinth flowers.



ocimenol cinnamyl alcohol

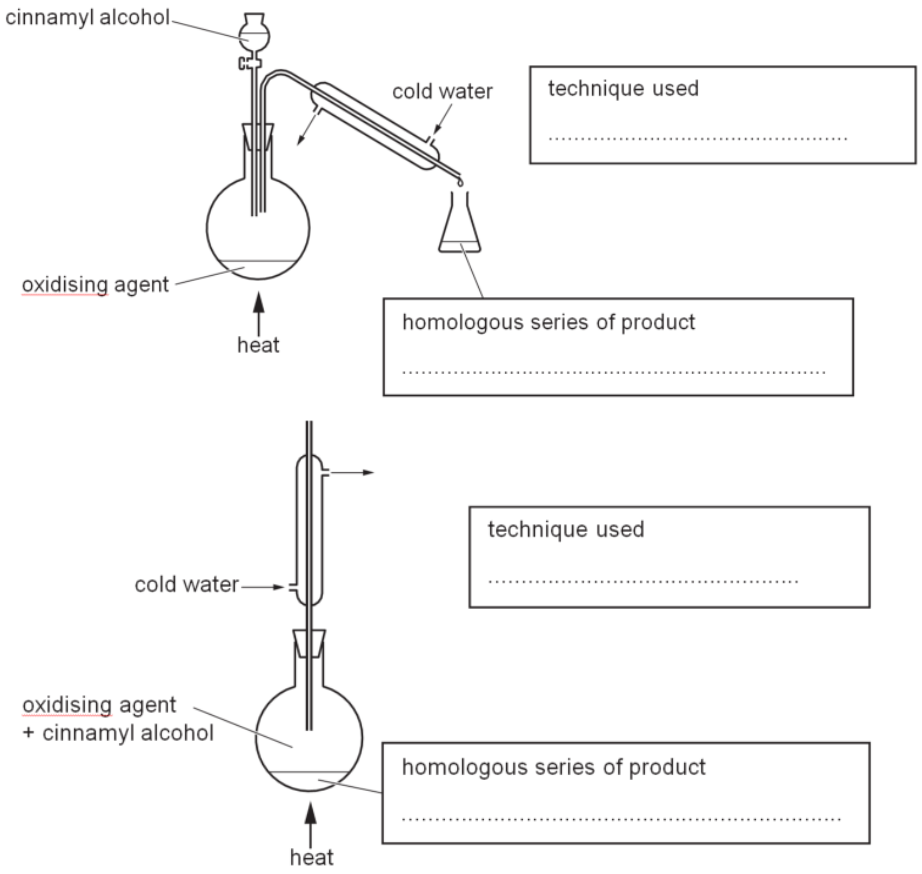
Acidified dichromate solution can be used to distinguish between these two compounds.Only cinnamyl alcohol can be oxidised using acid dichromate.

Explain why this is so, and describe any colour changes you would expect to see. **[2]**

1 (b) The products of the oxidation of cinnamyl alcohol by acid dichromate differ depending on theconditions.
Two experiments are shown below.

Name, in the appropriate boxes below:

- the technique used in each set up
- the homologous series of the final product of oxidation

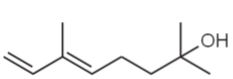


[4]

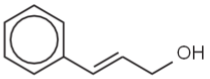
1 (c) Ocimenol and cinnamyl alcohol are both unsaturated molecules.

Explain how you could use a solution of bromine water to show which of the molecules has the greater degree of unsaturation. **[4]**

1 (d) Both ocimenol and cinnamyl alcohol molecules show stereoisomerism.



ocimenol

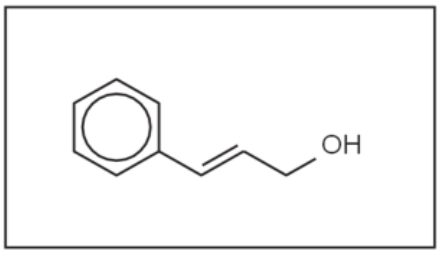


cinnamyl alcohol

- Name the **type** of stereoisomerism shown by these molecules.
- Explain how this isomerism arises.
- The structure of one of the stereoisomers of cinnamyl alcohol is shown in the left handbox below; draw the structure of the other isomer in the right hand box.

Type of stereoisomerism .....

Explanation



[3]

1 (e) Mass spectrometry can also be used to distinguish between ocimenol and cinnamyl alcohol.

The molecular ion peak in a mass spectrum of ocimenol is at an *m/z* value of 154.

What *m/z* value would represent the molecular ion peak in a mass spectrum of cinnamylalcohol?

m/z for cinnamyl alcohol molecular ion =…… **[1]**

Total Marks for Question Set 3 = 14