

5 (a) A homologous series is a family of organic compounds that have the same general formula and show a gradation in physical properties.

(i) State one other feature of a homologous series.

_____ [1]

(ii) Alkanes and alkenes are examples of homologous series. Complete the following table.

Name of homologous series	General formula	Molecular formula of compound with three carbon atoms
Alkanes		C_3H_8
Alkenes	C_nH_{2n}	

[2]

(iii) Name the alkane with the molecular formula C_3H_8 .

_____ [1]

(b) Alkanes and alkenes undergo combustion reactions.

(i) What is meant by the term combustion?

_____ [3]

(ii) Write a balanced symbol equation for the complete combustion of methane.

_____ [3]

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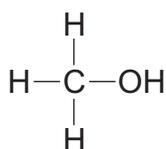
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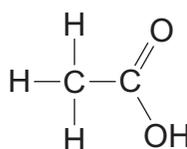
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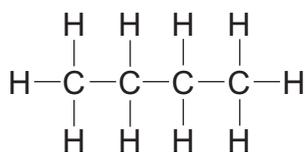
(e) The structures of four organic compounds are shown below.



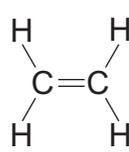
A



B



C



D

(i) Name compound **A**.

_____ [1]

(ii) What is the functional group in compound **B**?

_____ [1]

(iii) Explain why compound **C** is a hydrocarbon.

_____ [1]

(iv) Which compound (**A**, **B**, **C** or **D**) reacts with sodium carbonate?

_____ [1]

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(iii) Silver nitrate solution is colourless. What is the colour of the solution at the end of this reaction?

_____ [1]

(iv) Explain why copper displaces silver from a solution of silver nitrate.

_____ [2]

(b) Silver particles of size 1 to 100 nanometres (nm) are used to kill bacteria in wound dressings.

(i) Explain what you understand by a nanometre.

_____ [1]

(ii) Describe one risk which has been associated with the use of silver particles of this size.

_____ [1]

(c) Aluminium is a very useful metal due to its high electrical conductivity, relatively low density and lack of reactivity.

(i) Explain why aluminium shows a lack of reactivity even though the reactivity series would suggest it is a moderately reactive metal.

_____ [3]

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- (d) In a laboratory experiment 25.0 cm³ of white wine were placed in a conical flask and a few drops of phenolphthalein indicator added. Sodium hydroxide solution of concentration 0.1 mol/dm³ was then added slowly to the conical flask. The results of the titration are shown in the table below.

	Initial reading (cm ³)	Final reading (cm ³)	Titre (cm ³)
Titration 1 (rough)	0.0	20.0	20.0
Titration 2	0.0	18.9	18.9
Titration 3	0.0	19.1	19.1

- (i) Calculate the average titre.

Average titre _____ cm³ [2]

- (ii) Calculate the number of moles of sodium hydroxide solution used in this titration.

Moles of sodium hydroxide _____ [2]

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Question Number	Marks
1	
2	
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Total Marks	
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Examiner Number

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