

(Alkenes (double bonds, reactions, test with bromine water))

Q1. (2019)

The atmosphere of Titan contains small amounts of propene.

Describe a test to show that propene is an unsaturated hydrocarbon.

Give the result of the test.

[2 marks]

Test _____

Result _____

Q2. (2021)

This question is about cycloalkenes.

Cycloalkenes are ring-shaped hydrocarbon molecules containing a double carbon-carbon bond.

Cycloalkenes react in a similar way to alkenes.

Describe a test for the double carbon-carbon bond in cycloalkene molecules.

Give the result of the test.

[2 marks]

Test _____

Result _____

Q3. (2021)

Table 3 shows the name and formula of three cycloalkenes.

Table 3

Name	Formula
Cyclobutene	C_4H_6
Cyclopentene	C_5H_8
Cyclohexene	C_6H_{10}

Determine the general formula for cycloalkenes.

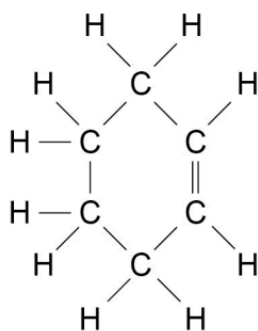
[1 mark]

General formula = _____

Q4. (2021)

Figure 6 shows the displayed structural formula of cyclohexene, C_6H_{10}

Figure 6

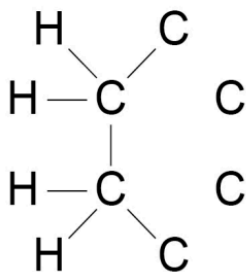


Chlorine reacts with cyclohexene to produce a compound with the formula $C_6H_{10}Cl_2$

Complete **Figure 7** to show the displayed structural formula of $\text{C}_6\text{H}_{10}\text{Cl}_2$

[2 marks]

Figure 7



Q5. (2021)

Calculate the percentage by mass of chlorine in a molecule of $\text{C}_6\text{H}_{10}\text{Cl}_2$

Relative atomic masses (A_r): H = 1 C = 12 Cl = 35.5

[3 marks]

Percentage by mass = _____ %

Q6. (2021)

This question is about alkenes and alcohols.

Ethene is an alkene produced from large hydrocarbon molecules.

Large hydrocarbon molecules are obtained from crude oil by fractional distillation.

Name the process used to produce ethene from large hydrocarbon molecules.

[1 mark]

Q7. (2021)

Describe the conditions used to produce ethene from large hydrocarbon molecules.

[2 marks]

Q8. (2022)

The heavy fuel oil fraction can be processed to produce smaller hydrocarbon molecules.

Name the process which produces smaller hydrocarbon molecules from heavy fuel oil.

Give the conditions used in this process.

[3 marks]

Name of process _____

Conditions _____

Q9. (2022)

Hydrocarbon molecules containing seven and eight carbon atoms can be produced when heavy fuel oil is processed.

Which pair of hydrocarbon molecules would **both** turn bromine water colourless?

[1 mark]

Tick (✓) **one** box.

C_7H_{14} and C_8H_{16}

☐

C_7H_{14} and C_8H_{18}

☐

C_7H_{16} and C_8H_{16}

☐

C_7H_{16} and C_8H_{18}

☐

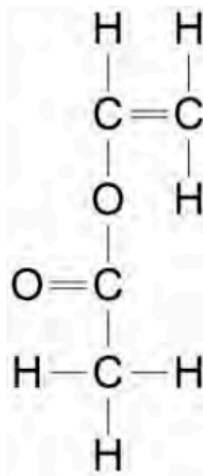
Q10. a). (2024)

This question is about monomers and polymers.

Compound **A** has an alkene functional group and an ester functional group.

Figure 8 represents a molecule of compound **A**.

Figure 8



Draw a circle around the alkene functional group on **Figure 8**.

[1 mark]

Q10. b). (2024)

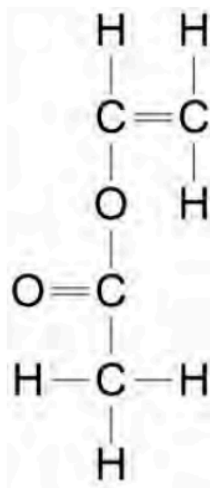
Describe what will be seen when compound **A** is shaken with bromine water.

[2 marks]

Q10. c). (2024)

Figure 9 is a repeat of **Figure 8**.

Figure 9



Draw a circle around the ester functional group on **Figure 9**.

[1 mark]

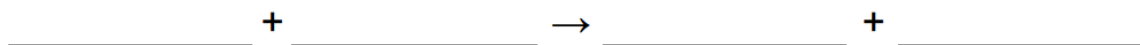
Q10. d). (2024)

Compound **A** has the formula C₄H₆O₂

Compound **A** is flammable.

Write a balanced equation for the complete combustion of compound **A**.

[3 marks]

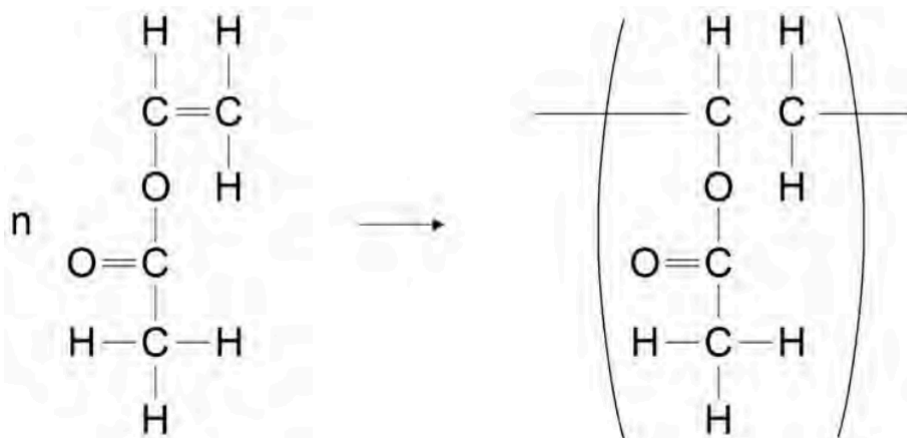


Q10. e). (2024)

Many molecules of compound **A** join together to form polymer **B**.

Complete the displayed formula equation which represents this reaction.

[2 marks]



Q10. f). (2024)

What type of polymer is polymer **B**?

[1 mark]

Tick (✓) **one** box.

Addition polymer

☐

Condensation polymer

☐

DNA

☐

Protein

☐

Q10. g). (2024)

Polymer **B** is a polymer which melts when heated.

What word is used to describe polymers which melt when heated?

[1 mark]

Q10. h). (2024)

Explain why some polymers do **not** melt when heated.

[2 marks]
