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Student number

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Name _____

Date _____

Attempt/Time taken _____

GCSE CHEMISTRY

Topic Paper: 7.2 Reactions of alkenes and alcohols
Part 1

Time allowed: 25 minutes

Materials

For this paper you must have:

- the Periodic Table/Data Sheet, provided as an insert (enclosed)
- a ruler with millimetre measurements
- a calculator, which you are expected to use where appropriate.

Instructions

- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- All working must be shown.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The Periodic Table/Data Sheet is provided as in insert.
- You are reminded of the need for good English and clear presentation in your answers.
- When answering questions you need to make sure that your answer:
 - is clear, logical, sensibly structured
 - fully meets the requirements of the question
 - shows that each separate point or step supports the overall answer.



21 Marks



Q1. Cooking oils contain unsaturated fats. Unsaturated fats are more healthy than saturated fats.

Unsaturated fats change bromine water from orange to colourless.

A scientist from a food company called Vegio wanted to find the amount of unsaturated fat in cooking oils.

The scientist tested Vegio’s own brand of oil and oils from four other companies, **A, B, C** and **D**.

The scientist used the same volume of oil for each test.

The scientist’s results are shown in the table below.

Company	Number of drops of bromine water that reacted		
	Test 1	Test 2	Test 3
Vegio	14	13	16
A	25	17	27
B	17	18	16
C	5	6	4
D	10	9	7

(a) (i) Describe how the bromine water is used to obtain these results.

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(3)

(ii) Choose **one** result from the table that should be tested again.

Result: Company Test

Why did you choose this result?

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(2)



(iii) The same volume of each oil was used for each test.

Suggest **one** other variable that should be controlled in these tests.

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(1)

(b) The Vegio food company claims that its cooking oil has more unsaturated fat than other cooking oils.

Compare the results for Vegio's cooking oil with the results of the other companies, **A**, **B**, **C** and **D**.

Give **three** conclusions that can be made from the results.

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(3)

(Total 9 marks)



Q2. Scientists state that unsaturated fats are healthier to eat than saturated fats.

The table shows some information about four fats.

Fat	Fat content as a percentage (%)		Melting point in °C
	Unsaturated	Saturated	
A	80	20	-11
B	60	40	-5
C	30	70	+4
D	10	90	+63

(a) (i) Which fat, **A**, **B**, **C** or **D**, has the lowest melting point?

(1)

(ii) Use the information in the table to describe the pattern between the percentage of unsaturated fat and the melting point.

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(1)

(iii) Which fat, **A**, **B**, **C** or **D**, contains the smallest number of carbon carbon double bonds

per gram?

(1)

(b) Fat **A** is reacted with hydrogen (hydrogenated).

State **one** way in which the physical properties of Fat **A** are changed by this reaction.

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(1)



(c) Tick (✓) **one** thing that scientists are **not** able to do.

One thing that scientists are not able to do	Tick (✓)
find out if a fat is unsaturated	
show that an unsaturated fat is healthier to eat than a saturated fat	
stop people eating unhealthy fat	
change unsaturated fat to saturated fat	

(1)
(Total 5 marks)

Q3. Olive oil has a melting point of -6°C and a boiling point of 300°C .
Olive oil has a high content of healthy, unsaturated fats.

(a) Olive oil can be hardened by reacting it with hydrogen.

(i) State the conditions needed for this reaction.

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(2)

(ii) A student said that hardening would make olive oil healthier.

Is this student's hypothesis correct?

Explain your answer in terms of what happens in the hardening process.

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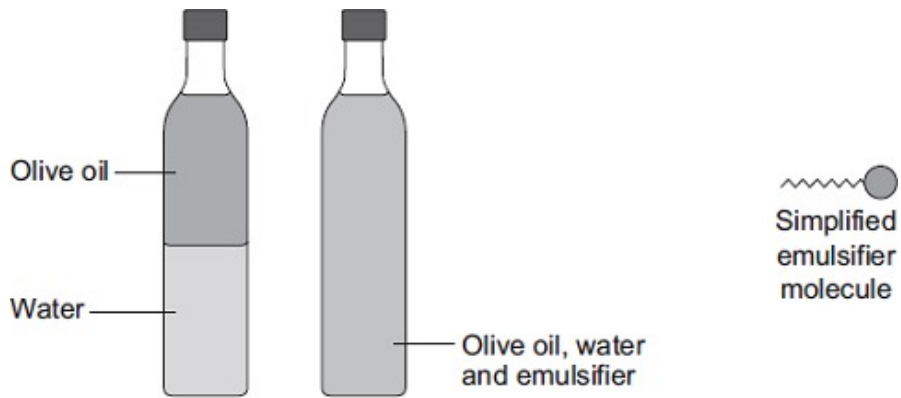
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(2)



- (b) Olive oil and water do not mix.
A salad dressing is made by shaking olive oil and water with an emulsifier.



Explain how these emulsifier molecules are able to produce a stable mixture after shaking olive oil and water.

Use the diagram of the simplified emulsifier molecule to help you to answer this question.

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(3)
(Total 7 marks)