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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 2

Time allowed: 30 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.



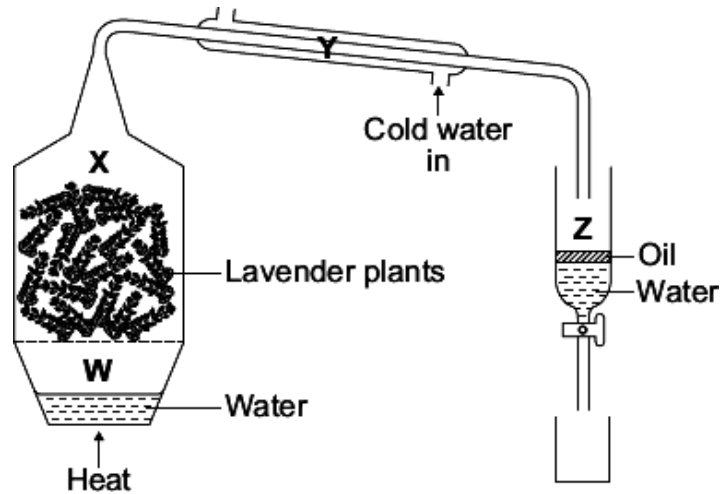
25 Marks

Q4. This question is about plant oils.

(a) Steam distillation is used to separate oils from plants.

The diagram shows some apparatus that can be used to separate oil from lavender plants.

Four parts of the apparatus are labelled **W**, **X**, **Y** and **Z**.



Describe how lavender oil is separated from the plant material.

You need to describe what happens in each of the parts, **W**, **X**, **Y** and **Z**, of the apparatus.

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(4)



(b) Olive oil can be used in the manufacture of margarine.
Olive oil has a melting point of $-6\text{ }^{\circ}\text{C}$ and contains about 11 % saturated fat and 89% unsaturated fat.

(i) Describe a test to show that olive oil contains unsaturated compounds.

Give the result of the test.

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(2)

(ii) To make margarine from olive oil the percentage of unsaturated fat needs to be decreased.

Give **one** reason why.

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(1)

(iii) Describe how to decrease the percentage of unsaturated fat in olive oil.

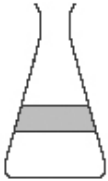
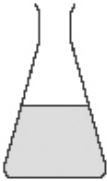
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(3)

(Total 10 marks)



Q5. (a) The diagrams show the results of shaking a vegetable oil with the substances indicated.

Vegetable oil and water	Vegetable oil, water and an additive
 Flask 1	 Flask 2

(i) Give a reason for the result in **Flask 1**.

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(1)

(ii) Explain the result in **Flask 2**.

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(2)

(b) Saturated fats are linked to heart problems. Oils that are unsaturated help to prevent heart disease. A company wants to make a 'healthy' soft margarine.

The company tested the same volume of different vegetable oils by shaking each with three drops of iodine solution. The results are shown in the table.

Vegetable oil	Time in minutes for the colour of iodine to 'disappear'
Olive oil	3.5
Peanut oil	3.0
Soya oil	1.5
Sunflower oil	1.0



(i) Why does iodine react with the molecules in these oils?

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(1)

(ii) Use the company results to evaluate which one appears to be the most 'healthy' vegetable oil to use in the soft margarine.

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(2)

(c) The ingredients of soft margarine include hydrogenated vegetable oil.

(i) Why is hydrogenated vegetable oil used in soft margarine?

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(1)

(ii) Describe how vegetable oils are hydrogenated.

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(2)

(Total 9 marks)



Q6. An advert for some crisps claims that they now contain only 30% saturated fat because they are cooked in sunflower oil. The crisp company used bromine water to compare percentage unsaturation of sunflower oil with four other vegetable oils, **A**, **B**, **C** and **D**.

Oil	Volume of bromine water added until the bromine colour just remains (cm ³)				Percentage unsaturation (%)
	Test 1	Test 2	Test 3	Average	
Sunflower	25.4	28.0	27.0	26.8	
A	13.0	14.0	15.0	14.0	35
B	23.2	11.2	24.0	23.6	59
C	19.9	21.1	20.2	20.4	51
D	9.5	8.8	9.3	9.2	23

(i) What is the range of percentage unsaturation for oils **A**, **B**, **C** and **D**?

Range = %

(1)

(ii) Describe and explain what happens to the first drops of bromine water that are added to these oils.

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(2)

(iii) The average for oil **B** is given as 23.6 cm³.

Explain how this average has been calculated.

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(1)



(iv) The results did **not** show that sunflower oil contains 30% saturated fat.

Explain why. (You will need to calculate the percentage unsaturation of sunflower oil.)

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(2)
(Total 6 marks)