

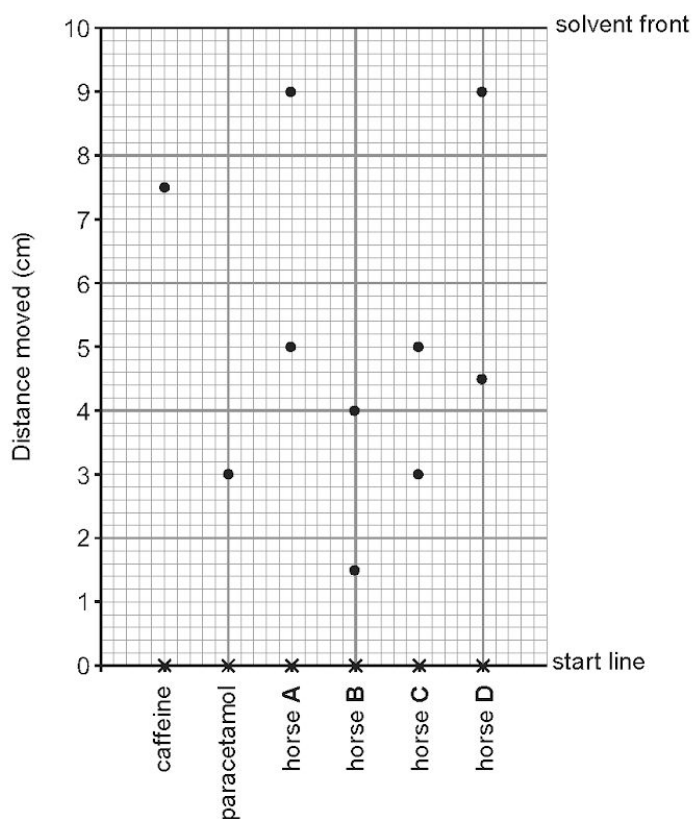
WJEC Chemistry GCSE

1: Pure Substances and Mixtures

Practice Questions

England Specification

1. Chromatography can be used to test if racehorses have been given illegal drugs. Urine samples from four horses, A–D, were tested to find out whether they contained caffeine or paracetamol. The following diagram shows the results obtained.



- (a) Give the letter of the horse, A–D, that had been given paracetamol. [1]

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- (b) State, giving a reason, if any of the four horses had been given caffeine. [1]

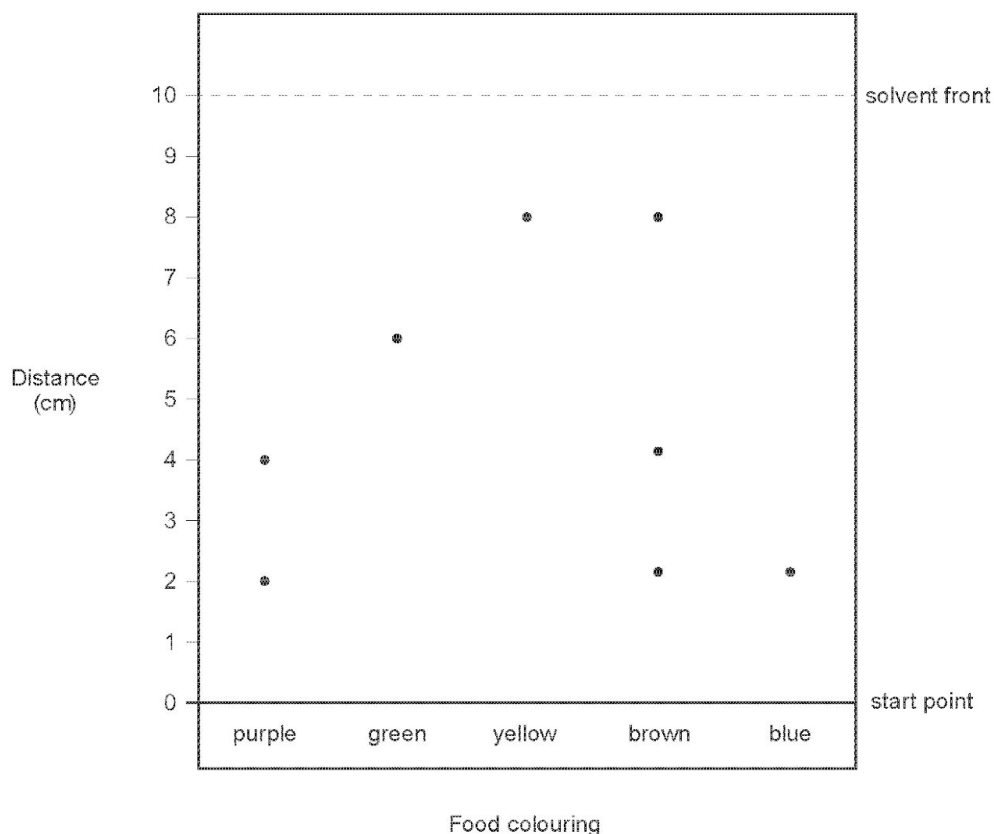
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- (c) The R_f value can be used to identify a substance. Use the following equation to calculate the R_f value of paracetamol. [2]

$$R_f \text{ value} = \frac{\text{distance moved by paracetamol}}{\text{distance moved by solvent}}$$

(Total 4)

2. The diagram below shows the chromatogram of several food colourings.



- (a) Use the chromatogram to give the two food colourings that are mixed to make brown food colouring. [1]

..... and

- (b) The R_f value of a substance can be used to identify that substance. The R_f value for a red food colouring is 0.4.

Use the equation below to calculate the distance this red food colouring would move on this chromatogram. [2]

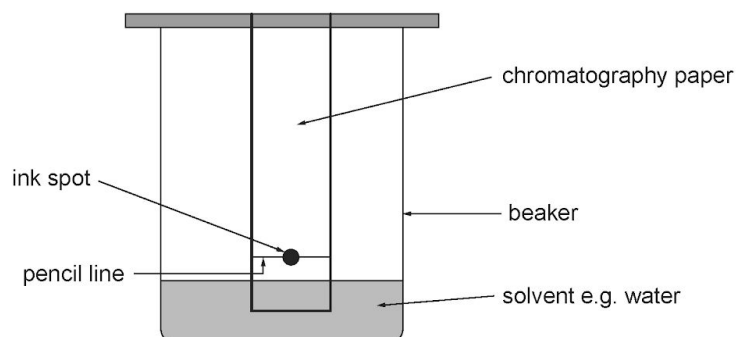
$$\text{distance moved} = R_f \times \text{distance moved by the solvent}$$

Distance moved = cm

- (c) Give the reason why water is used as the solvent when obtaining this chromatogram of food colourings. [1]

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3. Chromatography can be used to separate the pigments in ink.



Describe how chromatography can be used to determine whether two inks contain the same pigments. [6 QWC]

Your answer should include

- a description of how chromatography is carried out
- a description of what happens during the process
- how the results would show whether the two inks contain identical or different pigments.

You may include a diagram in your answer.

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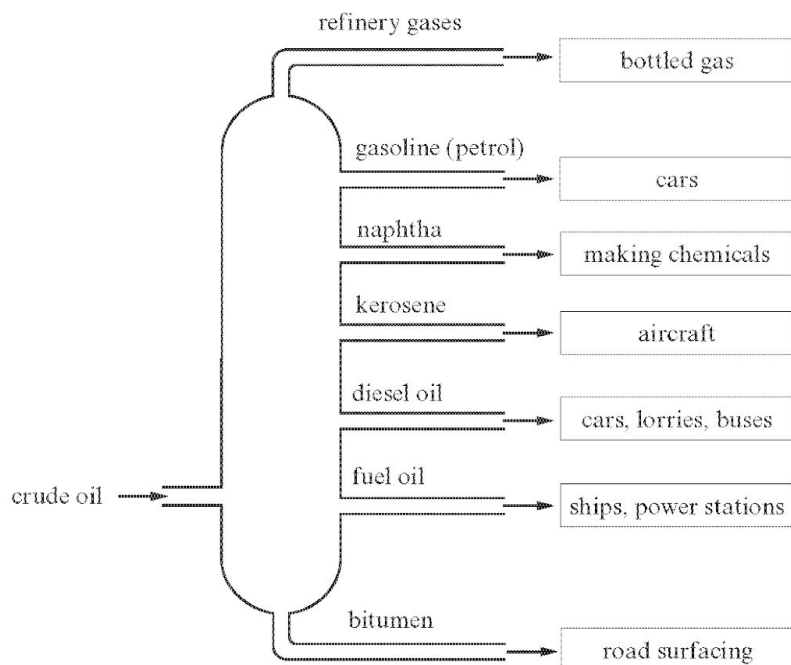
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(Total 6)

4. Crude oil is a mixture of hydrocarbons that is formed from the remains of simple marine organisms.

(a) State what is meant by a *hydrocarbon*. [1]

(b) Crude oil is separated into fractions in a process called fractional distillation.



State why the fractions obtained are not single compounds. [1]

(c) Most fractions are used as fuels. However, others are converted into small reactive molecules that can be used to form plastics.

Name the process used to

(i) produce the small reactive molecules, [1]

(ii) make plastics from these small reactive molecules. [1]

(Total 4)

5. Sodium chloride is made when sodium hydroxide solution reacts with dilute hydrochloric acid.



Describe a laboratory method for making crystals of pure sodium chloride from sodium hydroxide solution and dilute hydrochloric acid. [6 QWC]

Diagrams may be used as part of your answer.

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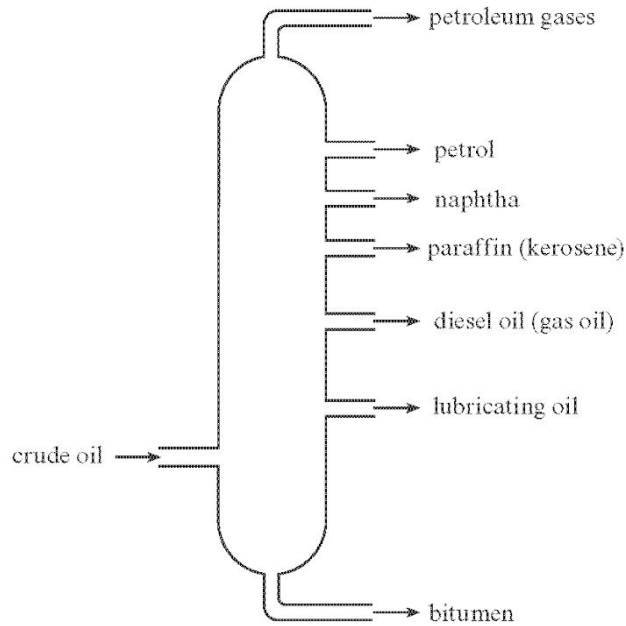
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6. The diagram below represents the separation of crude oil into useful fractions in industry.



Write an account of this industrial process.

[6 QWC]

Include in your answer

- the name of the separation method,
- what crude oil is,
- a description of how crude oil is separated.

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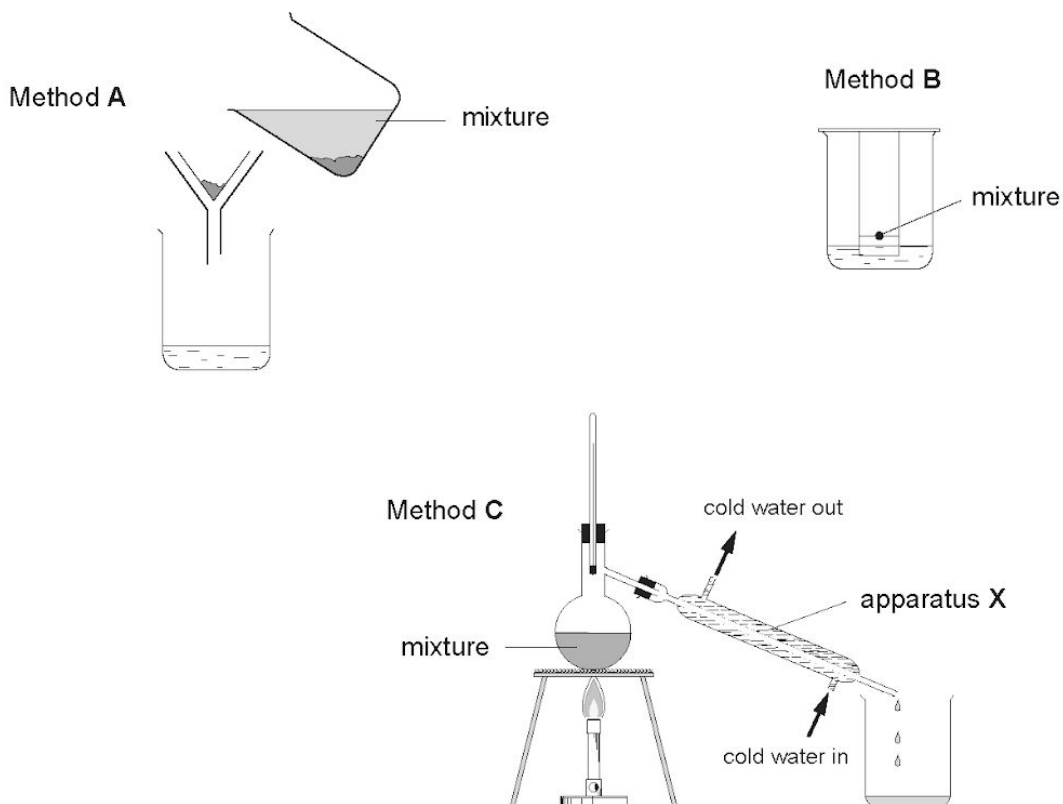
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(Total 6)

7. The diagrams below show three methods, **A**, **B** and **C**, used to separate mixtures.



(a) The names of the separation methods and some of the pieces of apparatus used are given in the box below.

beaker	distillation	chromatography
condenser	filter funnel	filtration

Choose the answers to parts (i) and (ii) from the box.

(i) Name apparatus X. [1]

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(ii) Give the name of method B. [1]

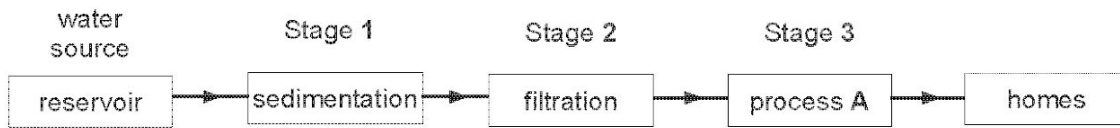
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(b) Give the letter of the method you would use to separate ethanol from water. [1]

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8. (a) The diagram below shows the three main stages in the treatment of public water supplies.



- (i) Reservoirs are a water source for public water supplies. Give the name of **one** other source. [1]

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- (ii) Give the number of the stage where large insoluble particles settle out and are removed from the water. [1]

Stage

- (iii)

fluoridation	chlorination	boiling	distillation
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In stage 3 the water is sterilised to kill bacteria and micro-organisms. Choose from the box above the name given to process A. [1]

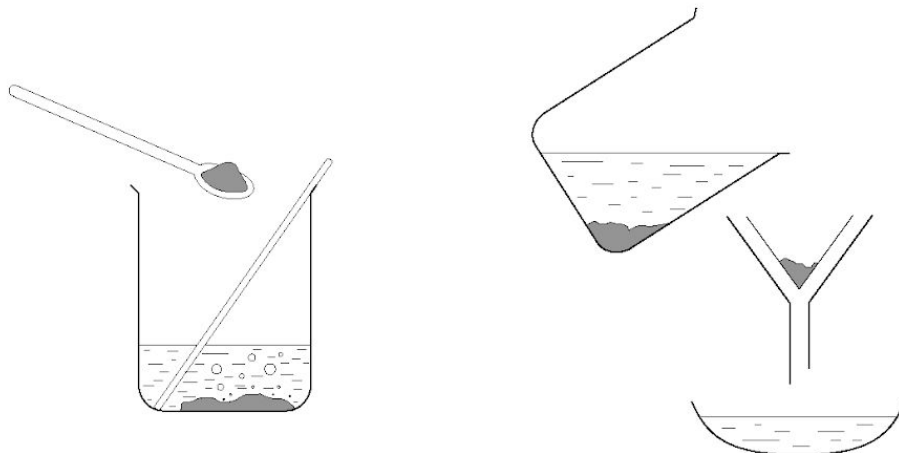
Process A

- (b) In drought conditions, suggest **one** way you could conserve water without affecting personal hygiene. [1]

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(Total 4)

9. Copper sulfate crystals can be prepared by reacting copper carbonate with dilute sulfuric acid.
The unlabelled diagrams below show two of the three stages involved.



Describe the preparation of copper sulfate crystals by this method.
Include in your answer what you would expect to see at each stage.

[6 QWC]

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