

NAME _____ INDEX NUMBER _____

SCHOOL _____ DATE _____

SIMPLE CLASSIFICATION OF SUBSTANCES

1. 1995 Q 15

Explain how you would separate mixture of nitrogen and oxygen gases given that their boiling points are -196°C and 183°C respectively (2 marks)

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2. 1995 Q 6 P2

(a) The table below gives information about the major constituents of crude oil. Study it and answer the questions that follow.

Constituent	Boiling point ($^{\circ}\text{C}$)
Gases	Below 40
Petrol	40-175
Kerosene	175-250
Diesel oil	250-350
Lubricating oil	350-400
Bitumen.	Above 400

(i) Which one of the constituents of crude oil has molecules with the highest number of carbon atoms? (2 marks)

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(ii) Name the process you would use to separate a mixture of petrol and diesel and explain how the separation takes place. (2 marks)

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(iii) Explain why the constituent of crude oil and write its formula (1mark)

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(iv) Name one gas that is likely to be a constituent of crude oil and write its formula. (1mark)

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(b) What condition could cause a poisonous gas to be formed when Kerosene is burnt? Explain (2marks)

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(c) Give one use of bitumen (1mark)

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3. 2001 Q 4a P2

a) Fraction distillation of liquid air usually produces nitrogen and oxygen as the major products.

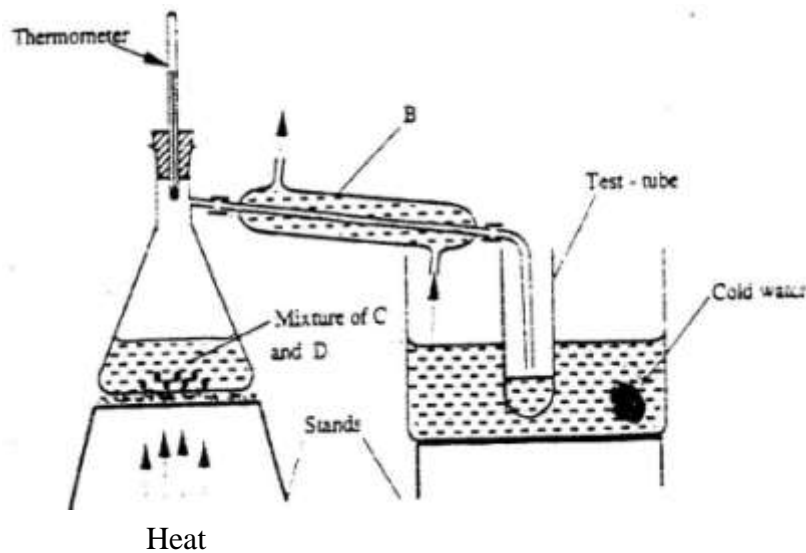
i) Name one substance that is used to remove carbon dioxide from the air before it is changed into liquid.

ii) Describe how nitrogen gas is obtained from the liquid air.
(Boiling points nitrogen = -196°C , oxygen = -183°C)

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4. 2003 Q 9

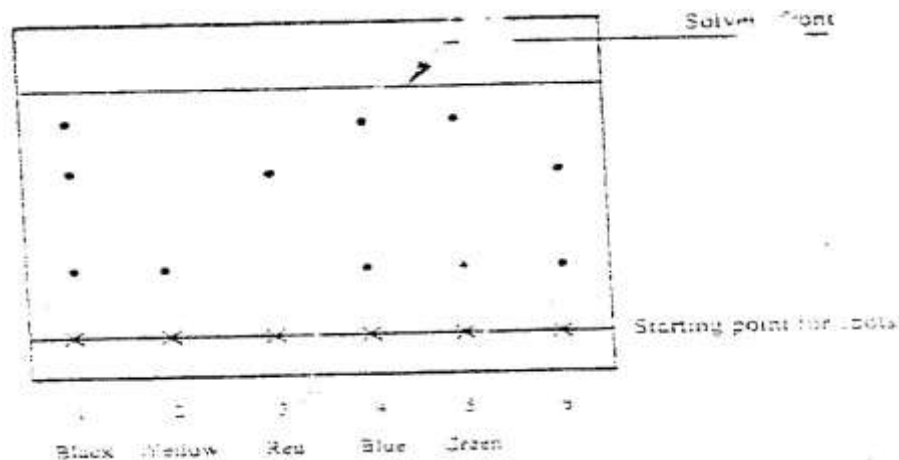
The set – up below represents the apparatus that may be used to separate a mixture of two miscible liquids C and D whose boiling points are 80⁰C and 110⁰C.



- (a) Name B
.....
- (b) What is the purpose of the thermometer (1 mark)
.....
.....
- (c) Which liquid was collected in the test tube? (1 mark)
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5. 2004 Q 27

A piece of chromatography paper was spotted with coloured inks obtained from pens labelled 1 to 6. The diagram below shows the spots after the chromatogram was developed.



a) Which two pens contained in the same pigment? (1 mark)

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b) Which pens contained only one pigment (1 mark)

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c) According to the chromatogram, which pigments are present in the ink of pen number 6. (1 mark)

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6. 2004 Q 6a P2

a) Crude oil is a source of many compounds that contain carbon and hydrogen only.

(i) Name the processes used to separate the components of crude oil (1 mark)

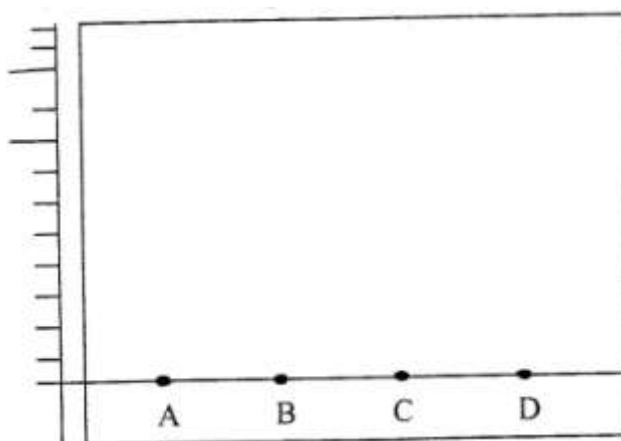
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(ii) On what two physical properties of the above components does the separation depend? (2 marks)

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7. 2005 Q 1 P2

(a) The diagram below shows spots of pure substance A,B, and C on a chromatography paper. Spot D is that of a mixture



After development, A, B and C were found to have moved 8cm, 3cm and 6 cm respectively. D has separated into two spots which had moved 6cm and 8 cm

(i) On the diagram
 I Label the baseline (origin) (1 mark)

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II Show the positions of all the spots after development (3 marks)

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(ii) Identify the substances present in the mixture D (2 marks)

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(b) Describe how solid ammonium chloride can be separated from a solid mixture of ammonium chloride and anhydrous calcium chloride (2 marks)

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(c) The table shows liquids that are miscible and those that are immiscible

Liquid	L ₃	L ₄
L ₁	Miscible	Miscible
L ₂	Miscible	Immiscible

Use the information given to answer the questions that follow

(i) Name the method that can be used to separate L₁ and L₃ from a mixture of two (1 mark)

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(ii) Describe how a mixture of L₂ and L₄ can be separated (2 marks)

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8. 2006 Q 10a

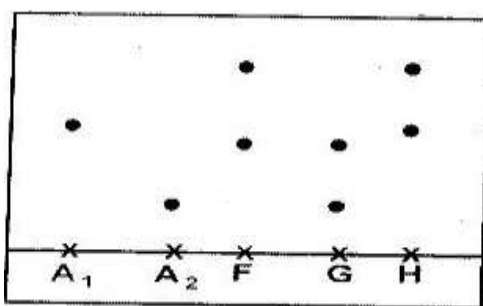
Name the process which takes place when:

- a) Solid carbon (IV) oxide (dry ice) changes directly into gas (1 mark)

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9. 2008 Q 14

Samples of urine from three participants F, G and H at an international sports meeting were spotted onto a chromatography paper alongside two from illegal drugs A₁ and A₂. A chromatogram was run using methanol. The figure below shows the chromatogram.



- a) Identify the athlete who had used an illegal drug. (1 mark)

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- b) Which drug is more soluble in methanol? (1 mark)

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10. 2008 Q 1a P2

- a) Biogas is a mixture of mainly carbon (IV) oxide and methane.
(i) Give a reason why biogas can be used as a fuel. (1 mark)

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- (ii) Other than fractional distillation, describe a method that can be used to determine the percentage of methane in biogas. (3 marks)

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11. 2009 Q 5a,b P2

(a) Figure 3 shows the changes that take place between states of matter. Some of them have been identified and others labelled.

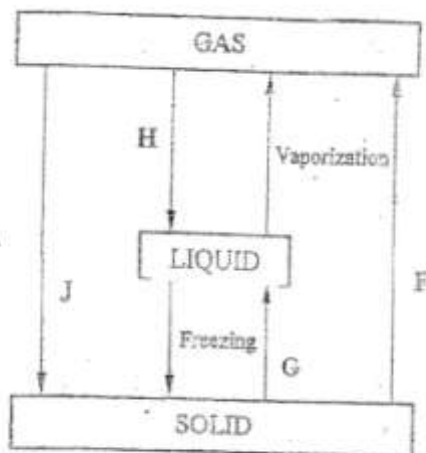


Figure 3

(i) Give the names of the process:

I H (1 mark)

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II G (1 mark)

.....

(ii) Name one substance that can undergo process F When left in an open container in the laboratory (1 mark)

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(iii) The process J is called deposition. Using water is an example; write an equation that represents the process of deposition. (1 mark)

(b) Figure 4 shows the heating curve for water

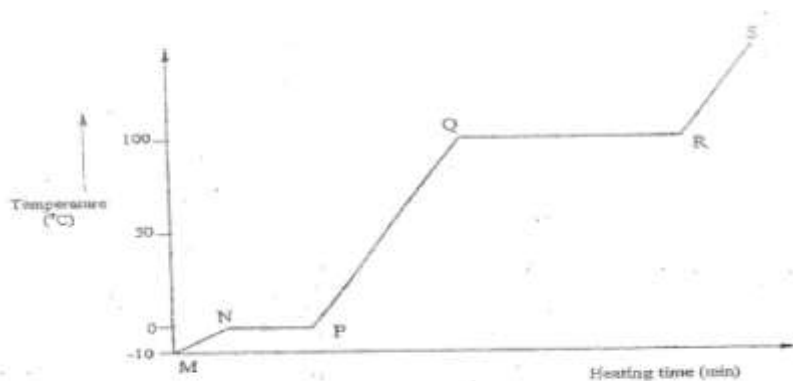


Figure 4

(i) Give the names of the intermolecular forces of attraction in the segments.

I MN (1 mark)

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II RS

(1 mark)

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12. 2012 Q2 P1

Iron (III) oxide was found to be contaminated with copper (II) sulphate. Describe how a pure sample of iron (III) oxide can be obtained. (3 marks)

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