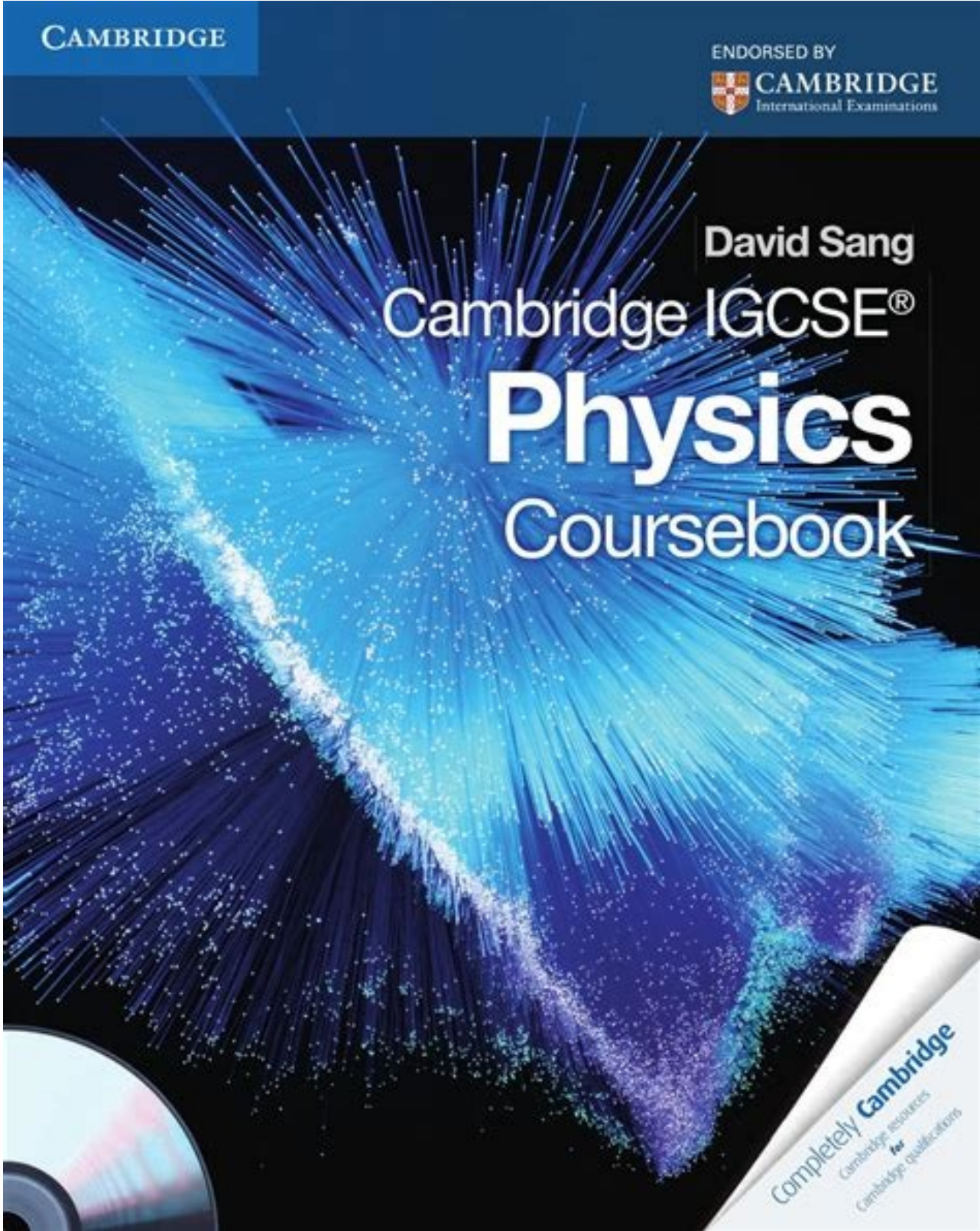


I'm not robot!

General Physics		
1 For constant motion:	$v = \frac{s}{t}$	's' is the velocity in m/s, 's' is the distance or displacement in meters and 't' is the time in sec.
2 For acceleration 'a':	$a = \frac{v-u}{t}$	u is the initial velocity, v is the final velocity and t is the time
3 Graphs in velocity-time graph the area under the graph is the total distance covered.	Area of a rectangular shaped graph = base × height Area of triangular shaped graph = ½ × base × height	
4 Weight is the force of gravity and mass is the amount of matter	$w = m \times g$	w is the weight in newton (N), m is the mass in kg and g is acceleration due to gravity = 10 m/s ²
5 Density ρ in kg/m ³ (g is the mass)	$\rho = \frac{m}{V}$	m is the mass and V is the volume
6 Force F in newtons (N)	$F = m \times a$	m is the mass and a is acceleration
7 Terminal Velocity: falling with air resistance	Weight of an object (downward) = air resistance (upward) implies no net force, therefore no acceleration, constant velocity	
8 Hooke's Law	$F = k \times x$	F is the force, x is the extension in meters and k is the spring constant
9 Moment of a force in Nm (also turning effect)	moment of force = F × d moment of force = F × d	
10 Law of moment or equilibrium	Total clockwise moment = total anticlockwise moment => F ₁ × d ₁ = F ₂ × d ₂	
11 Conditions of Equilibrium	Net force on system zero, net force on system zero, net moments zero	
12 Work done W joules (J)	$W = F \times d$	F is the force and d is the distance covered by an object same direction
13 Kinetic Energy E _k in joules (J)	$E_k = \frac{1}{2} m \times v^2$	m is the mass(kg) and v is the velocity (m/s)
14 Potential Energy E _p in joules (J)	$\Delta E_p = m \times g \times \Delta h$	m is mass (kg) and g is gravity and Δh is the height from the ground
15 Law of conservation of energy:	Loss of E _p = gain of E _k $m \times g \times h = \frac{1}{2} m \times v^2$	
16 Power in watts (W)	$P = \frac{\text{work done}}{\text{time taken}}$ $P = \frac{\text{energy transferred}}{\text{time taken}}$	
17 Efficiency:	$\text{Efficiency} = \frac{\text{useful output}}{\text{total energy input}} \times 100$	
18 Pressure p in pascal (Pa)	$p = \frac{F}{A}$	F is the force in newton (N) and A is the area in m ²
19 Pressure p due to liquid	$p = \rho \times g \times h$	ρ is the density in kg/m ³ , h is the height or depth of liquid in meters and g is the gravity
20 Atmospheric pressure	P=760mmHg = 760 mm Hg = 1.01 x 10 ⁵ Pa	
Energy source	renewable can be reused non-renewable cannot be reused Hydroelectric eg dam, waterfall Chemical energy eg petrol, gas Geothermal eg from earth's rock Nuclear fission eg from uranium Solar eg with solar cell Wind energy eg wind power station Tidal/wave energy eg tide in ocean	



Answers

Chapter 18

1. a) (i) methane
(ii) propane
(iii) pentane
(iv) propene
(v) ethene
(vi) but-1-ene

b)

$\begin{array}{ccccccc} & H & H & H & H & & \\ & | & | & | & | & & \\ H & - C & - C & - C & - C & - H & \\ & | & | & | & | & & \\ & H & H & H & H & & \end{array}$

(i) butane

$\begin{array}{ccccccc} & H & H & & & & \\ & | & | & & & & \\ H & - C & - C & - H & & & \\ & | & | & & & & \\ & H & H & & & & \end{array}$

(ii) ethane

$\begin{array}{ccccccc} & H & & H & & & \\ & | & & | & & & \\ H & - C & - C & = C & - C & - H & \\ & | & | & | & | & & \\ & H & H & H & H & & \end{array}$

(iii) but-2-ene

$\begin{array}{ccccccc} & H & H & H & & & \\ & | & | & | & & & \\ H & - C & - C & - C & - H & & \\ & | & | & | & & & \\ & H & H & H & & & \end{array}$

(iv) propane

$\begin{array}{ccccccc} & H & & & & & \\ & | & & & & & \\ H & - C & - O & - H & & & \\ & | & & & & & \\ & H & & & & & \end{array}$

(v) methanol

$\begin{array}{ccccccc} & H & H & H & & & \\ & | & | & | & & & \\ H & - C & - C & - C & - H & & \\ & | & | & | & & & \\ & H & H & C & - H & & \\ & & & | & & & \\ & & & H & & & \end{array}$

(vi) 2-methylpropane

$\begin{array}{ccccccc} & H & & H & & & \\ & | & & | & & & \\ H & - C & = C & = C & & & \\ & | & | & | & & & \\ & H & H & C & - H & & \\ & & & | & & & \\ & & & H & & & \end{array}$

(vii) 2-methylpropene

$\begin{array}{ccccccc} & H & H & H & H & & \\ & | & | & | & | & & \\ H & - C & - C & - C & - C & - H & \\ & | & | & | & | & & \\ & H & H & H & H & & \end{array}$

(viii) pent-1-ene

2. a) The existence of molecules with the same molecular formula but different structural formulae.

b)

$CH_3-CH_2-CH_2-CH_3$
butane

$\begin{array}{c} CH_3 \\ | \\ CH_3-CH-CH_3 \end{array}$
2-methylpropane

(In these and subsequent formulae, if you aren't asked specifically for displayed formulae, these quicker forms are acceptable.)

c)

$CH_3CH_2CH_2CH_2CH_2CH_3$
hexane

$\begin{array}{c} CH_3 \\ | \\ CH_3CHCH_2CH_2CH_3 \end{array}$
2-methylpentane

$\begin{array}{c} CH_3 \\ | \\ CH_3CH_2CHCH_2CH_3 \end{array}$
3-methylpentane

$\begin{array}{c} CH_3 \\ | \\ CH_3CHCHCH_3 \\ | \\ CH_3 \end{array}$
2,3-dimethylbutane

$\begin{array}{c} CH_3 \\ | \\ CH_3CCH_2CH_3 \\ | \\ CH_3 \end{array}$
2,2-dimethylbutane

(If you are a home-schooling parent, this is going to be a bit of a nightmare to sort out. Anything else is just a twisted form of one of these. The trick is to make sure that you always draw the longest chain horizontally. Duplicates usually arise from breaking that rule.)

35

 **Pearson**
Edexcel

Mark Scheme (Results)

January 2020

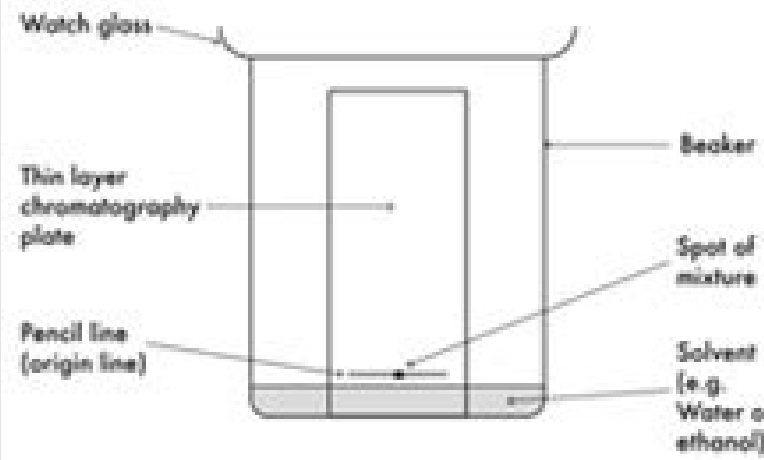
Pearson Edexcel International GCSE in
Chemistry (4CH1)
Paper 2CR

CHROMATOGRAPHY

☆ **Chromatography is a technique used to separate unknown substances by dissolving them in an appropriate solvent**

Chromatography can be carried out on a thin layer chromatography plate, usually made of plastic or glass and coated with silica gel. It can also be carried out on chromatography paper.

The diagram below shows the set up for thin layer chromatography; it would be a similar setup for paper chromatography.



What key precautions should you take when setting up the apparatus for chromatography?

.....

.....

.....

The individual solutes within the substance move up the sheet or paper with the solvent; smaller and/or more soluble molecules will move further up the paper and vice versa. Using the distance moved by both the solvent and the solutes you can calculate a retention value for each solute.



☆ **Rf is a ratio so will be less than 1 and has no units**
Calculate the Rf values for the three solutes on the chromatogram above and complete the table below

Solute	Rf value
A	
B	
C	

Give three examples of how chromatography can be used for analysis.

.....

.....

.....

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IGCSE Chemistry Revision Answers Test 1 Experimental Techniques Test 3 Atoms, Elements and Compounds 1. (a), (b) and (d) 2. (b) 3. 1 mortar 2 thermometer 3 tripod stand 4 Bunsen burner 4. (a) 5. T, T, T, T, F 6. A Obtaining ethanol from a mixture of water and ethanol. B Separating the different colours in a sample of ink. C Obtaining sand from a mixture of sand and seawater. D Obtaining large copper sulphate crystals from an aqueous solution of copper sulphate. Test 2 Experimental Techniques 1. (a), (b) and (c) 2. (c) 3. T, T, F, F, T 4. (b) 5. Pipette 6. Hydrochloric acid; filter; calcium chloride; sand; water 7. Equipment A Thistle funnel Equipment B Conical flask Equipment C Gas jar 1. (c) 2. (b), (c), and (d) 3. (a) 4. (d) 5. (c) 6. Nucleus; electrons; neutrons 7. (a) 8. F, T, F © Hodder Education 2009 Test 4 Atoms, Elements and Compounds 1. 1 The dark brown colour of the liquid is seen just above the dish. 2 A medium brown colour is seen close to the dish. 3 A light brown colour is seen some distance from the dish. 4 The same light brown colour is seen throughout the beaker. 2. (b) 3. (d) 4. 1. graphite; 2. diamond; 3. graphite; diamond; 4. diamond; 5. graphite; 6. diamond 5. -2 6. (c) 7. (c) Test 5 Atoms, Elements and Compounds Test 8 Substances and Stoichiometry 1. (c) 2. (b) 3. (c) 4. (c) 5. (c) 6. (a) 7. Radioactive; radioactive; nuclei; radiation; measuring; medical; treating; sterilising 8. 1 Hydrogen chloride gas 2 Water 3 Hydrogen chloride dissolved in water 1. (a) 2. (c) 3. (b) 4. (b) 5. (a), (c) and (f) 6. (a) 7. T, T, F, F, F 8. (d) 9. (b), (c) and (e) Test 7 Substances and Stoichiometry 1. (c) 2. (a) 3. (c), (d) and (e) 4. (d) 5. F, F, T, F, T 6. (d) 7. (d) 8. (a) and (b) 9. T © Hodder Education 2009 Test 10 Electricity and Chemistry 1. (d) 2. T, T, F 3. (a) 4. (a) 5. (b), (d), and (e) Test 11 Electricity and Chemistry 1. F, F, T 2. (b) 3. (a) and (d) 4. Metals; hydrogen; non-metals; hydrogen 5. (c) 6. T, F, F, T 7. (b) 8. (b) and (c) Test 12 Electricity and Chemistry 1. F, T, F 2. (d) 3. (b) 4. (b) and (d) 5. (b) and (c) Test 13 Electricity and Chemistry 1. Hydrogen 2. (a) 3. Gain; reduced 4. T, T, F, F, T 5. T, T 6. A Impure copper B Pure copper C Copper sulphate solution 7. Negatively; ions; electrons Test 14 Electricity and Chemistry 1. (d) 2. (b) 3. (a) and (d) 4. (d) 5. (a) and (c) © Hodder Education 2009 Test 15 Chemical Changes and Reactions 1. (c) and (d) 2. (a) 3. F, T, T, F 4. (a) 5. (d) 6. (b) Test 16 Chemical Changes and Reactions 1. (b) 2. T, F 2. 7 3. (b), (c) and (d) 4. (d) 5. (d) 6. F, F, T, T 7. (d) 8. (a) © Hodder Education 2009 Test 22 Acids, Bases and Salts 1. (a) and (d) 2. (c) 3. (c) 4. Hydrogen; neutral; 7 5. (a) and (b) 6. Step 1 Add nickel powder a little at a time to sulphuric acid until the nickel is in excess. Step 2 Heat the mixture to allow it to react. Step 3 Filter off the excess nickel. Step 4 Boil the filtrate until its volume is reduced to half the original. Step 5 Allow the nickel sulphate to crystallise. 7. (a) 8. (d) Test 23 Acids, Bases and Salts 1. (a) and (d) 2. (b) 3. (d) 4. mineral R calcium carbonate gas T carbon dioxide solid W calcium oxide solid X calcium hydroxide 5. (c) Test 24 Acids, Bases and Salts 1. 2. 3. 4. 5. (c) (b) T, T, F, F (e) (a) and (b) 6. (b) 7. (d) 8. (d) Test 25 Acids, Bases and Salts 1. Protons; some 2. F, T, F, F 3. (a) 4. (b) 5. (b) 6. (b) 7. (d) Test 26 Periodic Table 1. (d) 2. (a), (c) and (d) 3. A transition metal Fe Forms an acidic oxide N Has six electrons in its outer S shell Has a giant covalent structure C Reacts rapidly with water K Has a higher proton (atomic) Br number than iron 4. (b) and (c) 5. (c) and (d) 6. (a) 3. (a) and (c) 4. (d) 5. Elements; period 6. (d) 7. T, F, T, F 8. (b) 9. Hydrogen Test 27 Periodic Table 1. Bromine passing through sodium iodide F, F, F, T, F 2. A = gas B = pale yellow C = between -85°C and -200°C 3. (b) and (c) 4. (b) and (d) 5. (b) and (e) 6. (c) 7. (c) Test 29 Metals 1. Calcium oxide 2. (c) 3. F, T, T 4. (c) 5. 1 magnesium 2 zinc 3 iron 6. (c) 7. (c) 8. (a) and (c) Test 31 Metals 1. (c) and (d) 2. (a) and (b) 3. (b) 4. (b) 5. (a) 6. F, F, T, T 7. (b) 8. (a) Chlorine passing through sodium bromide Iodine passing through sodium chloride 2. (b) © Hodder Education 2009 Test 30 Metals brown orange brown 1. F, T, T, F, T 2. (b) and (d) 3. (c) 4. Sodium; bauxite 5. (c) 6. (c) Test 33 Metals 1. T, T, F, F 2. (c) and (d) 3. 12 4. (d) 5. (b) 6. Oxide 3. (a) and (c) 4. (d) 5. Elements; period 6. (d) 7. T, F, T, F 8. (b) 9. Hydrogen Test 34 Air and Water 1. 2. 3. 4. 5. 6. (b) (a) (c) Combustion; carbon monoxide (a), (b) and (c) (a) and (e) © Hodder Education 2009 7. chlorine This gas is used to purify water. This gas is used to fill helium weather balloons. This gas is made when carbon acid rain dissolves dioxide limestone buildings. 8. (a) and (d) Test 35 Air and Water 1. T, T, F, F, F, T 2. T, F, T, F, T, F 3. (b) 4. (b) 5. (a), (b) and (c) 6. (a), (b) and (c) Test 36 Organic Chemistry 1. (c) 2. (c) 3. Compounds; functional 4. T, T, T, F 5. (c) Test 37 Organic Chemistry 1. (b) 2. number of single bonds 4 number of double bonds 1 3. (b) 4. T, F, F, T 5. Lighter; lower 6. (c) and (d) 7. (c) Test 38 Organic Chemistry 1. (b) and (d) 2. (a) 3. Hydrogen 4. Paraffin/kerosene; diesel; fuel gas 5. F, T, F, T Test 39 Organic Chemistry 1. (d) 2. (a), (c) and (d) 3. (c) 4. (b), (c) and (e) 5. (b) and (d) Test 40 Organic Chemistry 1. (c) 2. (b) 3. (c), (d), and (e) 4. (c) 5. F, T, F, T 6. F, F, T, T 7. (c) and (d) Test 41 Organic Chemistry 1. (a) 2. (d) 3. (a) 4. (c) 5. F, T, T, T, F 6. (b), (c) and (e) 7. (b) 8. (b) and (c) © Hodder Education 2009 Click a link below to access the resources you require. Cambridge IGCSE Chemistry Practice Book Answers to all the questions in the book Oops, the page you're looking for Disappeared Full PDF PackageDownload Full PDF PackageThis PaperA short summary of this paper27 Full PDFs related to this paperDownloadPDF Pack

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