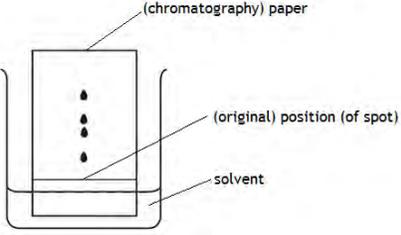


Question number	Answer	Notes	Marks
1 (a)	D (filtration)		1
(b) (i)		<p>award one mark for each correct label</p> <p>solvent: ALLOW label line to any point under the solvent level</p> <p>paper: ALLOW label line to paper, including under solvent level</p> <p>original spot: has to be in the centre of the baseline i.e. below the visible spots</p>	3
(ii)	<u>Four</u> because there are <u>four</u> spots/dots (above the baseline in the chromatogram)	ALLOW blobs / marks / colours IGNORE refs to different heights	1

Question number	Answer	Notes	Marks
2 a	D / simple distillation		1
b	C / fractional distillation		1
c	B / filtration		1
d	A / crystallisation		1

Question number	Answer	Notes	Marks
3 a i	to prevent spots/them dissolving/mixing (in the solvent) / OWTTE	Accept substance(s)/pigment(s)/dye(s) for spots Ignore references to diffusion/absorption Ignore references to spots smudging/running Accept spots would be washed off/away Ignore water for solvent	1
ii	Any two from: M1 evaporation /loss of solvent / OWTTE M2 risk of fire M3 fumes may be toxic/poisonous	Accept water for solvent Ignore gas escaping Ignore it is flammable only Ignore harmful/dangerous Ignore references to substances entering tank/spillage Ignore references to reaction with air	2

b	<p>M1 cross in box A (chlorophyll is not present in carrots, sweet potatoes or tomatoes)</p> <p>M2 cross in box C (both beta-carotene and lycopene are present in sweet potatoes)</p> <p>M3 cross in box E (Both carrots and tomatoes contain a pigment other than beta-carotene, chlorophyll and lycopene)</p>	<p>If more than three answers given mark on list principle: eg four answers given with 3 correct and 1 incorrect scores 2 marks eg all five answers given so 3 correct and 2 incorrect scores 1 mark</p>	3
c	<p>M1 (distance between start line and solvent front) = 6(.0)</p> <p>M2 correct evaluation of R_f value $1.3/6.0 = 0.22$</p>	<p>Accept answer to 1 or more dp, eg 0.2, 0.217, Accept 0.216recurring Reject 0.216</p> <p>correct answer with no working scores 2</p> <p>M2 CQ on M1</p>	2
d	(there is a substance in sweet potatoes that) does not dissolve/is insoluble (in the solvent)	<p>Ignore mix Ignore water for solvent Reject not very soluble/partially soluble</p>	1

Question number	Answer	Notes	Marks
4 d	i white precipitate	Accept solid / ppt / ppte / suspension in place of precipitate Reject other colours Reject other observations eg fizzing Ignore cloudy/milky/grey	1
	ii silver chloride	Accept correct formula Ignore incorrect formula Award both marks if both answers in either (i) or (ii)	1
	iii (hydrochloric/sulfuric) acid / H ⁺ there OR solution acidic	Accept because there are no other ions that could form a precipitate Accept no carbonate/hydroxide (ions)	1
e	M1 wash/rinse (with water) M2 leave it (to dry) / leave in a warm place / place in an oven / place in desiccator / heat it / dry with absorbent paper (eg kitchen/filter/blotting)	Reject methods that refer to filtrate /solution /crystallisation Ignore other named solvents Accept leave on a window ledge Ignore evaporate it / boil it Award 1 mark for both M1 and M2 correct but in wrong order	2
			Total 10 marks

Question number	Answer	Notes	Marks
5 (a)	<p>M1 – C</p> <p>M2 – (it) has a spot in line with/at the same height as (the spot produced by) bute/an illegal drug</p>	<p>Accept references to travelling same distance / having same R_f value</p> <p>M2 dep on M1</p>	<p>1</p> <p>1</p>
(b)	a substance/liquid that dissolves a solute/solid/another substance	Accept it forms a solution with a solute/solid/substance	1
(c)	<p>M1 $\frac{\text{correctly measured distance for lasix spot}}{\text{correctly measured distance of solvent front}}$</p> <p>M2 – any value in range 0.73 – 0.77</p>	<p>Lasix spot 62-64 mm / 6.2-6.4 cm Solvent front 84 mm / 8.4 cm</p> <p>Minimum of 2 dp correct answer with no working scores 2</p> <p>M2 csq on M1</p>	<p>1</p> <p>1</p>
(d)	the more soluble the substance the further it will travel	Allow distance increases with (increasing) solubility ignore any reference to proportionality	1
Total 6 marks			

9 (c)	$\text{Cl}_2 + 2 \text{NaOH} \rightarrow \text{NaCl} + \text{NaClO} + \text{H}_2\text{O}$ M1 - all formulae correct M2 - balanced using correct formulae		2
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Question number	Answer	Notes	Marks
7 (a) (i)	$\text{Zn(s)} + 2 \text{HCl(aq)} \rightarrow \text{ZnCl}_2\text{(aq)} + \text{H}_2\text{(g)}$ <p>M1 – all formulae correct and equation balanced</p> <p>M2 – state symbols correct</p>	<p>M2 can be awarded for near misses on formulae, e.g. ZnCl and H</p> <p>accept upper case letters for state symbols</p>	2
(b)	<p>M1 bubbles/fizzing/effervescence</p> <p>M2 zinc/solid gets smaller/disappears</p>	<p>accept gas given off ignore hydrogen given off</p> <p>accept zinc/solid dissolves / (final) solution is <u>colourless</u> reject zinc melts and other Group 1 observations, eg floats / moves across surface</p> <p>Ignore references to heat and temperature change</p>	2

Question number	Answer	Notes	Marks												
7 (c) (i)	<table border="1"> <thead> <tr> <th></th> <th>Experiment 1</th> <th>Experiment 2</th> </tr> </thead> <tbody> <tr> <td>Final burette reading in cm³</td> <td>10.40</td> <td>22.70</td> </tr> <tr> <td>Initial burette reading in cm³</td> <td>0.00</td> <td>1.90</td> </tr> <tr> <td>Volume of acid added in cm³</td> <td>10.40</td> <td>20.80</td> </tr> </tbody> </table> <p>M1 – all four burette readings correct</p> <p>M2 – subtractions correct</p> <p>M3 – all six values in table given to 2 decimal places</p> <p>(ii) M1 – (because) the volume/amount of acid required has doubled</p> <p>M2 – the concentration is half / 0.37 (mol dm⁻³)</p> <p>OR</p> <p>M1 for use of an expression such as $V_1c_1 = V_2c_2$</p> <p>M2 for indicating how c_2 can be calculated (e.g. because $V_1, c_1,$ and V_2 are known) / for an answer of 0.37 (mol dm⁻³)</p>		Experiment 1	Experiment 2	Final burette reading in cm ³	10.40	22.70	Initial burette reading in cm ³	0.00	1.90	Volume of acid added in cm ³	10.40	20.80	<p>Ignore trailing zeroes for M1 and M2</p> <p>M2 CSQ on burette readings given in table</p> <p>Mark independently</p> <p>accept either a calculation or a description</p>	<p>3</p> <p>1</p> <p>1</p>
	Experiment 1	Experiment 2													
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