AQA GCSE Chemistry | 8462

SPECIFICATION POINT 4.8.3.7

Flame emission spectroscopy

Mark schemes and examiner comments

Tier	**Higher**
Question groups	**4**
Available paper years	**2008–2018**

Using this booklet

1. Booklet answer numbers match the question booklet.
2. Use the original question number within marking tables.
3. Examiner comments are included where available.

Name: _____ **Date:** _____

Where a precise marking extract is unavailable, the full source document is included in an appendix. Any missing mark scheme is explicitly identified.

4.8.3.7 Flame emission spectroscopy

Answer 01 · Mark scheme January 2008 | CHY3H | Original Q6 | Legacy

Question 6

question	answers	extra information	mark
(a)(i)		each correct test and one result = **1** mark	
		one other result for any test = **1 mark** this mark can only be awarded once	1
	Na_2CO_3: HCl → (odourless) gas (1) CO_2 / carbon dioxide (1)		1
	NaCl: $AgNO_3$ → white ppt (1) silver chloride (1)		1
	$NaNO_3$: Al + NaOH → pungent /sharp smell / choking gas (1) NH_3 / ammonia (1)		1
	Na_2SO_4: $BaCl_2$ → white ppt (1) barium sulfate (1)		1
(a)(ii)	all would give a yellow / yellow-orange (flame) / same coloured (flame) / same results **or** they all contain sodium owtte	allow orange (flame)	1
(b)	any **two** from: • fast / quick or comment about speed • small amounts • sensitive / accurate • ease of automation • sample not used up • reliable / efficient • can be left to run / continuous analysis	ignore cost ignore human error accept any valid answer accept operators do not need chemical skills ignore results can be saved	2
total			8

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Answer 02 · Mark scheme

June 2012 | CH2HP | Original Q1 | Legacy

Question 1

question	answers	extra information	mark
1(a)(i)	prevent evaporation of solvent	allow prevent loss of solvent allow to support the (chromatography) paper	1
1(a)(ii)	ink dissolves in the solvent **or** carbon / graphite does not dissolve in the solvent	allow ink 'runs' / spreads **or** pencil does not 'run' / spread allow ink would affect the result / mixes with colours accept pencil for carbon / graphite	1
1(b)(i)	4		1
1(b)(ii)	any **one** from: • because not all colours match • not all colours are safe • some colours could be unsafe • some colours travelled higher (than safe colours)	no mark for 'no / don't know' ignore numbers	1
1(c)(i)	any **two** from: • rapid / quick • accurate • sensitive **or** detects very small quantities	ignore reliable / precise accept small sample	2

Question 1 continues on the next page . . .

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CH2HP

Question 1 cont'd…..

question	answers	extra information	mark
1(c)(ii)	separates		1
1(c)(iii)	identifies solvents / compounds / substances	accept (relative) molecular mass accept formula mass accept M_r accept relative mass accept molecular ion peak	1
Total			**8**

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Answer 02 · Mark scheme

June 2012 | CH2HP | Original Q1 | Legacy

CH2HP

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Answer 03 · Mark scheme

January 2013 | CH2HP | Original Q4 | Legacy

question	answers	extra information	mark
4(a)	it is not used up	accept does not change accept reusable allow does not react	1
4(b)	they would melt **or** they have a low melting point	allow would lose their shape ignore soften	1
	because there are no cross links **or** there are weak intermolecular forces	accept there are weak bonds / forces between (polymer) chains	1
4(c)(i)		ignore reference to mass spectroscopy do **not** accept other incorrect process described	
	substances carried by gas	allow named gas	1
	(through) column / coil / tube **or** (through) solid (material) / powder		1
	at different speeds	accept different retention times	1
4(c)(ii)	(relative) molecular mass / M_r	allow (relative) formula mass **or** relative mass ignore relative atomic mass ignore identity of substance / molecule	1
Total			**7**

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Answer 03 · Mark scheme

January 2013

CH2HP

4.8.3.7 Flame emission spectroscopy

Answer 04 · Mark scheme June 2018 | 8462/2H | Original Q1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.1	yellow	allow orange allow orange-yellow	1	AO1 4.8.3.1
01.2	copper (ion)	allow Cu^{2+} allow copper (II) allow barium (ion) allow Ba^{2+}	1	AO1 4.8.3.1
01.3	(flame) colours are masked	allow (flame) colours mix / blend allow only see one colour allow cannot see two colours at once ignore hard to distinguish	1	AO1 4.8.3.1
01.4	Li^+ Na^+		1 1	AO2 4.8.3.7
01.5	bromide (ion)	allow Br^- ignore bromine	1	AO1 4.8.3.4
01.6	add barium chloride (solution) add hydrochloric acid white precipitate produced	allow barium nitrate (solution) allow nitric acid allow acidified do **not** accept sulfuric acid dependent on use of a barium compound	1 1 1	AO1 4.8.3.5
Total			**9**	

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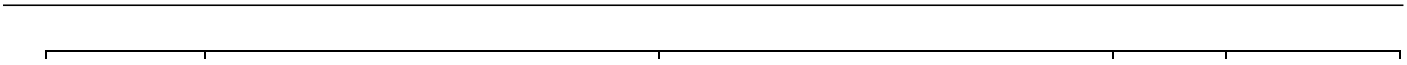
Answer 04 · Mark scheme

June 2018 | 8462/2H | Original Q1



4.8.3.7 Flame emission spectroscopy

Answer 04 · Examiner comments

June 2018 | 8462/2H | Original Q1

Question 1 (standard demand)

01.1 80% of students gave yellow or orange. There was a lot of variety in the wrong answers with all the colours of the spectrum represented.

01.2 This was well answered. Copper was the most common answer given although a few gave barium and gained credit.

01.3 60% of students achieved this mark. Popular incorrect responses implied that the flame colours were similar or the same.

01.4 87% of students could correctly identify both of the ions in the flame emission spectrum.

01.5 33% of students identified the correct answer as bromide. A few put bromine but many seemed to guess.

01.6 The test for sulfate ions was not well known with many students gaining only the acidification mark. 27% of students achieved full marks.