AQA

Level 3 Certificate/Extended Certificate
APPLIED SCIENCE
ASC1/C

Unit 1 Key Concepts in Science

Section B – Chemistry

Mark scheme

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Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this mark scheme are available from aqa.org.uk

Level of response marking instructions

Level of response mark schemes are broken down into levels, each of which has a descriptor. The descriptor for the level shows the average performance for the level. There are marks in each level.

Before you apply the mark scheme to a student's answer read through the answer and annotate it (as instructed) to show the qualities that are being looked for. You can then apply the mark scheme.

Step 1 Determine a level

Start at the lowest level of the mark scheme and use it as a ladder to see whether the answer meets the descriptor for that level. The descriptor for the level indicates the different qualities that might be seen in the student's answer for that level. If it meets the lowest level then go to the next one and decide if it meets this level, and so on, until you have a match between the level descriptor and the answer. With practice and familiarity you will find that for better answers you will be able to quickly skip through the lower levels of the mark scheme.

When assigning a level you should look at the overall quality of the answer and not look to pick holes in small and specific parts of the answer where the student has not performed quite as well as the rest. If the answer covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level and then use the variability of the response to help decide the mark within the level, ie if the response is predominantly level 3 with a small amount of level 4 material it would be placed in level 3 but be awarded a mark near the top of the level because of the level 4 content.

Step 2 Determine a mark

Once you have assigned a level you need to decide on the mark. The descriptors on how to allocate marks can help with this. The exemplar materials used during standardisation will help. There will be an answer in the standardising materials which will correspond with each level of the mark scheme. This answer will have been awarded a mark by the Lead Examiner. You can compare the student's answer with the example to determine if it is the same standard, better or worse than the example. You can then use this to allocate a mark for the answer based on the Lead Examiner's mark on the example.

You may well need to read back through the answer as you apply the mark scheme to clarify points and assure yourself that the level and the mark are appropriate.

Indicative content in the mark scheme is provided as a guide for examiners. It is not intended to be exhaustive and you must credit other valid points. Students do not have to cover all of the points mentioned in the Indicative content to reach the highest level of the mark scheme.

An answer which contains nothing of relevance to the question must be awarded no marks.

Question	Answers	Additional comments	Mark	AO	ID
01.1	alkali <u>metals</u>	ignore S block / reactive metals	1	AO1	E
01.2	solubility decreases from lithium to sodium (sulfate)	allow solubility of lithium does not fit the trend	1	AO3	
	solubility of sulfates increases from sodium to caesium (sulfate)		1	AO3	
		if no other marks awarded allow 1 mark for solubility decreases and then increases (as you go down the group)			E
01.3	2 -	allow negative do **not** allow incorrect magnitude of charge e.g. 1 - / 3 -	1	AO2	E
01.4	sodium hydroxide / NaOH **or** sodium oxide / Na_2O **or** sodium carbonate / Na_2CO_3		1	AO2	E
01.5	correct balanced equation		1	AO2	E
01.6	sodium		1	AO2	
	any **two** from, • sodium has the lowest ionisation energy (and therefore must have a larger atomic radius) • atomic radius get smaller across the period • (each element has the) same amount of shielding • lowest number of protons	 allow outer electrons for each element are in the same shell allow less attraction for outer shell electrons	2	AO1	E

01.7	$\dfrac{24.7}{39.1}$ $\dfrac{34.8}{54.9}$ $\dfrac{40.5}{16.0}$	an answer of $KMnO_4$ scores 3 marks	1	AO2	E
	(ratio =) 1:1:4	allow $\dfrac{0.632}{0.632}$ $\dfrac{0.634}{0.632}$ $\dfrac{2.53}{0.632}$	1	AO2	
	(=) $KMnO_4$		1	AO2	

| Total | | | 12 | | |

Question	Answers	Additional comments	Mark	AO	ID
02.1	covalent		1	AO1	E
02.2	at least one (carbon) atom shown joined to three other (carbon) atoms	ignore multiple layers	1	AO1	E
	hexagon shapes		1	AO1	
02.3	giant ionic		1	AO2	A
Total			**4**		

Question	Answers	Additional comments	Mark	AO	ID
03.1	the enthalpy change when one mole (of a compound)		1	AO1	
	is burnt completely in oxygen (under standard conditions, and with everything in its standard state)		1	AO1	E
03.2	all arrows pointing upwards	minimum of two arrows must be drawn	1	AO1	E
03.3	it is an element		1	AO1	E
Total			**4**		