Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CHEMISTRY **0620/33**

Paper 3 Core Theory **October/November 2018**

MARK SCHEME

Maximum Mark: 80

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2018 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

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GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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Question	Answer	Marks
1(a)(i)	C	**1**
1(a)(ii)	E	**1**
1(a)(iii)	B	**1**
1(a)(iv)	A	**1**
1(a)(v)	A	**1**
1(b)	electrons in Cu^+: 28 (1) neutrons in Ne: 12 (1) protons Ne 10 **AND** Cu^+: 29 (1)	**3**

Question	Answer	Marks
2(a)(i)	One mark each for any 2 of: • concentration of sodium in squid / nerves lower ORA • concentration of potassium in squid / nerves higher ORA • concentration of hydrogencarbonate in squid / nerves lower ORA	**2**
2(a)(ii)	3.9 (g)	**1**
2(b)	flame test / description of flame test (1) flame coloured yellow (1)	**2**
2(c)	$C_2H_7O_3NS$	**1**

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Question	Answer	Marks
2(d)	One mark each for any four of: • (chromatography) paper / (filter) paper dipping into liquid • suitable chromatography vessel e.g. beaker • named solvent e.g. water / ethanol • (base) line drawn **OR** spot (of ink or dye) drawn near bottom of paper and labelled **AND** (base) line / spot above solvent level • let solvent run up paper (to separate spots)	**4**

Question	Answer	Marks
3(a)(i)	L	**1**
3(a)(ii)	harder / stronger / more resistant to corrosion	**1**
3(b)(i)	(zinc + nitric acid) → zinc nitrate + nitrogen dioxide + water (2) If 2 marks not scored: 1 mark for any 2 correct products in equation	**2**
3(b)(ii)	nitrogen dioxide / NO_2 (1) lightning / high temperature furnaces (1)	**2**
3(c)	oxygen removed from the zinc oxide / zinc oxide loses oxygen / it loses oxygen	**1**
3(d)(i)	⇌	**1**
3(d)(ii)	add water	**1**

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Question	Answer	Marks
4(a)(i)	C=C (double bond)	**1**
4(a)(ii)	orange / red-brown (1) to colourless / decolourised (1)	**2**
4(a)(iii)	structure of COOH group showing all atoms and all bonds	**1**
4(a)(iv)	turns it red / pink	**1**
4(b)(i)	One mark each for any two of: • not much decrease / gradual decrease in pH at first • sudden decrease in pH as more acid added • not much decrease / gradual decrease in pH when acid in excess	**2**
4(b)(ii)	any value between pH 12.65 and 12.75 (inclusive)	**1**
4(b)(iii)	14 cm^3	**1**

Question	Answer	Marks
5(a)	***gas:*** arrangement: random / no arrangement / irregular (1) motion: moving rapidly / moving randomly / move everywhere (1) ***solid:*** arrangement: regular / in rows/lattice (1) motion: **only** vibrating / not moving (from place to place) / stay in position (1)	**4**
5(b)	2 (H_2SO_4) (1) 2 (H_2O) (1)	**2**

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Question	Answer	Marks
5(c)	(acidify with nitric acid and) add (aqueous) silver nitrate AND white precipitate / white solid (2) if 2 marks not scored 1 mark for add (aqueous) silver nitrate	**2**
5(d)(i)	cathode correctly labelled (1) electrolyte correctly labelled (1)	**2**
5(d)(ii)	positive electrode: chlorine / Cl_2 negative electrode: copper / Cu	**2**
5(d)(iii)	bubbles / strong smell (of chlorine)	**1**

Question	Answer	Marks
6(a)(i)	S	**1**
6(a)(ii)	U	**1**
6(a)(iii)	T	**1**
6(a)(iv)	R	**1**
6(a)(v)	U	**1**
6(b)	iodine (1) chlorine is more reactive than iodine ORA (1)	**2**
6(c)	2nd box down ticked (calcium phosphate)	**1**

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Question	Answer	Marks
6(d)	ammonia produced / calcium hydroxide reacts with ammonium (salts) (1) (ammonia) is a gas / (ammonia) escapes into the air / reduction of soil nitrogen (1)	**2**

Question	Answer	Marks
7(a)	gas syringe drawn / measuring vessel dipping into trough of water drawn (1) gas syringe or measuring cylinder correctly labelled (1) workable apparatus e.g. airtight (1)	**3**
7(b)(i)	any value between 5.0 and 5.5 min (inclusive)	**1**
7(b)(ii)	96 cm^3	**1**
7(c)	initial gradient of line less steep and starting at 0–0 (1) levelling off at a lower volume (1)	**2**
7(d)(i)	hematite / any other ore of iron e.g. siderite	**1**
7(d)(ii)	air (1) monoxide (1) decomposes (1) slag (1)	**4**

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Question	Answer	Marks
8(a)(i)	state of fluorine: gas (1) boiling point of chlorine: between – 160 °C and 20 °C (inclusive of these two values) (1)	**2**
8(a)(ii)	(chlorine is a) gas (at room temperature)	**1**
8(b)(i)	to kill bacteria	**1**
8(b)(ii)	any suitable use e.g. coolant / solvent / chemical use in named reaction e.g. hydration of alkenes	**1**
8(c)	2 (P) (1) 3 (Cl_2) (1)	**2**
8(d)	pair of bonding electrons between C*l* atoms (1) 6 non-bonding electrons around each chlorine atom (1)	**2**

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