Mark Scheme (Results)

Pearson Edexcel

Additional Sample Assessment Materials GCSE 9-1
Paper 2: Chemistry 1CH0/2F

First examination 2018

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Summer 2018

General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Pearson Edexcel Leve1 / Level 2 GCSE (9-1) in Chemistry

Paper 1CH0/2F – Mark scheme

Question number	Answer	Mark
1(a)	volcanoes	(1)

Question number	Answer	Mark
1(b)	**B** carbon dioxide	(1)

Question number	Answer	Additional guidance	Mark
1(c)	An explanation that combines identification - understanding (1 mark) and reasoning/ justification - understanding (1 mark) • photosynthesis occurs (1) • so more / increasing amount of oxygen (1)	 allow plants (take in carbon dioxide and) release oxygen ignore reference to breathing reject respiration ignore produce oxygen reference to increasing required /owtte	(2)

Question number	Answer	Mark
1(d)(i)	0.0401 - 0.0318 (1) = 0.0083	(1)

Question number	Answer	Additional guidance	Mark
1(d)(ii)	• other factors may change (1) • both rising does not prove one causes the other (1)	ignore references to anomalies	(2)

(Total for Question 1 = 7 marks)

Question number	Answer	Mark
2(a)(i)	**D** transparent	**(1)**

Question number	Answer	Additional guidance	Mark
2(a)(ii)	An explanation that combines identification – application of knowledge (1 mark) and reasoning/ justification - application of understanding (1 mark) • metal (1) • because it has a (very) high ability to conduct electricity (1)		**(2)**

Question number	Answer	Additional guidance	Mark
2(b)	An explanation that combines identification via a judgment (1 mark) to reach a conclusion via justification/reasoning (1 mark): • concrete alone is not strong enough / in reinforced concrete the strength is increased by setting the concrete around steel rods (1) • presence of steel enables structure to flex without cracking (1)		**(2)**

Question number	Answer	Mark
2(c)(i)	**D** 100 nm	**(1)**

Question number	Answer	Additional guidance	Mark
2(c)(ii)	Any two from: • protects skin (from Sun) (1) • titanium dioxide blocks / reflects ultraviolet light (1) • nanoparticles are not visible (on skin) (1)		**(2)**

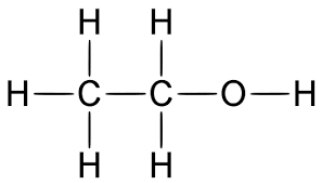
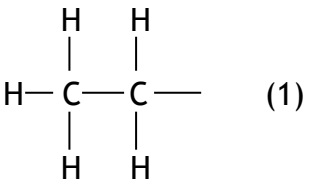
(Total for Question 2 = 8 marks)

Question number	Answer	Additional guidance	Mark
3(a)(i)	measuring cylinder / burette / pipette		(1)

Question number	Answer	Additional guidance	Mark
3(a)(ii)	Any two suggestions from the following: • use a lid (1) • lag the beaker / wrap insulation around the sides of the beaker (1) • use a draft shield (1)	allow cover the top	(2)

Question number	Answer	Additional guidance	Mark
3(a)(iii)	temp rise for 0.25 g = 40 - 21 (°C) (1) = 19 (°C) temp rise for 1.0 g = $\frac{19}{0.25}$ (°C) (1) = 76 (°C)	allow full marks for correct answer with no working	(2)

Question number	Answer	Additional guidance	Mark
3(b)(i)	fractional distillation	allow fractionation	(1)

Question number	Answer	Additional guidance	Mark
3(b)(ii)	 (2)	—O—H (1)  (1)	(2)

Question number	Answer	Mark
3(b)(iii)	ethanoic (acid)	(1)

(Total for Question 3 = 9 marks)

Question number	Answer	Mark
4(a)	**B** dissolving	**(1)**

Question number	Answer	Additional guidance	Mark
4(b)	An answer that combines the following points of application of knowledge and understanding to provide a logical description: • use a thermometer (1) • to measure initial and final temperature (1)		**(2)**

Question number	Answer	Mark
4(c)	**B** endothermic	**(1)**

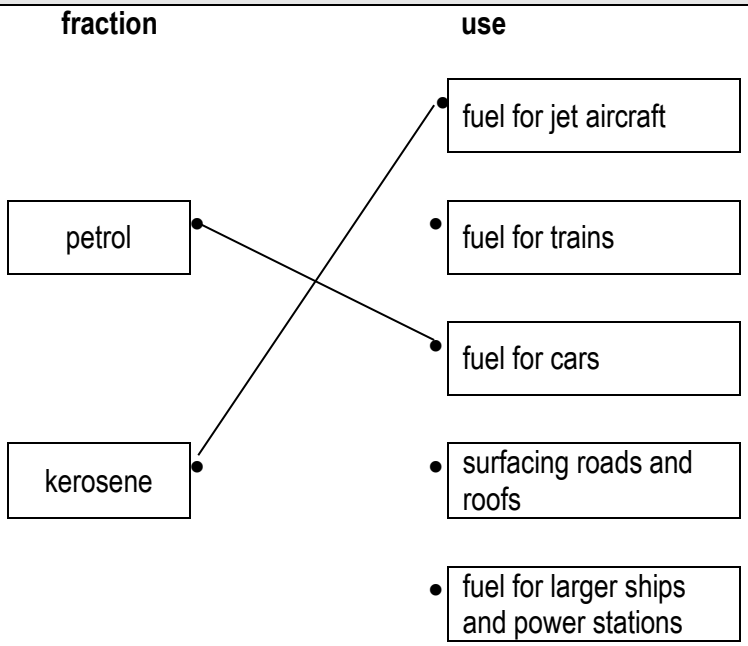
Question number	Answer	Additional guidance	Mark
4(d)	Any two suggestions from the following: • (same) volume of water (1) • (same) mass of solid (1) • (same rate of) stirring (1)		**(2)**

Question number	Answer	Additional guidance	Mark
4(e)	25 cm^3 solution contains = 0.25 g ammonium chloride 1 cm^3 solution contains = $\frac{0.25}{25}$ g (1) 10 cm^3 solution contains = $\frac{0.25}{25}$ x 10 g (1) = 0.1 (g)	allow full marks for correct answer with no working	**(2)**

(Total for Question 4 = 8 marks)

Question number	Answer	Mark
5(a)(i)	bitumen	(1)

Question number	Answer	Mark
5(a)(ii)	(different) boiling point (ranges)	(1)

Question number	Answer	Additional guidance	Mark
5(a)(iii)	 (2)	reject if more than one line drawn from a fraction	(2)

Question number	Answer	Additional guidance	Mark
5(b)(i)	as the number of carbon atoms in the molecule increases, the boiling point increases (1)	accept reverse argument	(1)

Question number	Answer	Additional guidance	Mark
5(b)(ii)	relative formula mass = (3 X 12) + (8 X 1) (1) = 44	Award mark if correct answer given with no working	(1)

Question number	Answer	Additional guidance	Mark
5(b)(iii)	propane + oxygen → carbon dioxide + water LHS (1) RHS (1)	ignore air allow reactants on LHS and products on RHS in either order allow $C_3H_8 + 5\,O_2 \rightarrow 3CO_2 + 4H_2O$ (2) incorrect balancing of correct species max 1 mark ignore state symbols even if incorrect allow = for →	**(2)**

Question number	Answer	Additional guidance	Mark
5(b)(iv)	An explanation that combines identification - understanding (1 mark) and reasoning/justification - understanding (1 mark): **EITHER** carbon monoxide/CO formed (1) toxic/poisonous/restricts the amount of oxygen carried (by the blood) (1) **OR** carbon/smoke/soot formed (1) damages lungs/chokes people/breathing difficulties /makes things dirty (1)	 ignore carbon dioxide ignore dangerous/harmful allow the second mark if an incorrect gas is given *e.g.* methane allow second mark if 'gas' stated, but no name is given allow less energy released ignore dangerous/harmful allow blocks fuel jets allow less energy released	**(2)**

(Total for Question 5 = 10 marks)

Question number	Answer	Mark
6(a)	alkali metals	(1)

Question number	Answer	Mark
6(b)	**C** hydrogen	(1)

Question number	Answer	Mark
6(c)(i)	any value greater than 0 and less than 5 s	(1)

Question number	Answer	Additional guidance	Mark
6(c)(ii)	Any two from • effervesces (1) • melts (1) • catches fire (1) • explodes (1) • makes alkaline solution (1)	allow moves very quickly / moves about	(2)

Question number	Answer	Additional guidance	Mark
6(d)	safety screen / eye protection / gloves	Ignore 'tie long hair back'	(1)

Question Number	Answer	Additional guidance	Mark
6(e)(i)	calcium + oxygen → calcium oxide LHS (1) RHS (1)	ignore air allow reactants on LHS in either order allow $2Ca + O_2 \rightarrow 2CaO$ (2) incorrect balancing of correct species max 1 mark ignore state symbols allow = for →	(2)

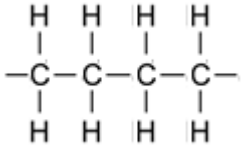
Question number	Answer	Additional guidance	Mark
6(e)(ii)	Ca : O 1.05/40 : 0.42/16 (1) 0.026 : 0.026 1 : 1 (1) empirical formula CaO (1)	allow ecf formula alone scores max 1 mark	**(3)**

(Total for Question 6 = 11 marks)

Question number	Answer	Mark
7(a)(i)	**C** yes yes	**(1)**

Question number	Answer	Mark
7(a)(ii)	**D** changes from orange to colourless	**(1)**

Question number	Answer	Additional guidance	Mark
7(b)(i)	C_2H_4 + **3**O_2 → **2**CO_2 + **2**H_2O (2) LHS (1) RHS (1)	ignore state symbols	**(2)**

Question number	Answer	Additional guidance	Mark
7(b)(ii)	 (2)	allow 1 mark for four carbon atoms joined by single bonds allow 1 mark for correct formula without continuation bonds	**(2)**

Question number	Indicative content	Mark
***7(c)**	Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlines in the generic mark scheme. The indicative content below is not prescriptive and candidates are not required to include all the material which is indicated as relevant. Additional content included in the response must be scientific and relevant. • poly(propene) is used to make e.g. plastic buckets / bowls • because it is (relatively) strong / tough / inert / easily moulded into shape • poly(propene) is used to make e.g. ropes / fabrics / carpets • because it can extruded / made into fibres / strong / tough / flexible / a good insulator • poly(chloroethene) is used to make e.g. plastic window frames / pipes / gutters • because it is tough / hard / inert / long lasting / waterproof /a good insulator • poly(chloroethene) is used to make e.g. insulation for wires • because it is a good insulator / inert / (relatively) strong / tough / flexible • PTFE is used for e.g. non-stick pans / kitchenware • because it is slippery / tough / inert /has a high melting point • PTFE is used for e.g. coating skis / stain proofing fabrics / carpets • because it is slippery • PTFE is used to make e.g. containers for corrosive substances • because it is inert allow any suitable use of the three polymers related to their properties	**Exp (6)**

Level	Mark	Descriptor
	0	• No awardable content
Level 1	1-2	• Demonstrates elements of chemical understanding, some of which is inaccurate. Understanding of scientific ideas lacks detail. (AO1) • The explanation attempts to link and apply knowledge and understanding of scientific ideas, flawed or simplistic connections made between elements in the context of the question. (AO2)
Level 2	3-4	• Demonstrates chemical understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas is not fully detailed and/or developed. (AO1) • The explanation is mostly supported through linkage and application of knowledge and understanding of scientific ideas, some logical connections made between elements in the context of the question. (AO2)
Level 3	5-6	• Demonstrates accurate and relevant chemical understanding throughout. Understanding of the scientific ideas is detailed and fully developed. (AO1) • The explanation is supported throughout by linkage and application of knowledge and understanding of scientific ideas, logical connections made between elements in the context of the question. (AO2)

(Total for Question 7 = 12 marks)

Question number	Answer	Mark
8(a)	**D** 11, 12, 10	**(1)**

Question number	Answer	Additional guidance	Mark
8(b)	• {1 pair of/two} electrons shared between two fluorine atoms (1) • rest of structure correct (1)	ignore inner shells	**(2)**

Question number	Answer	Additional guidance	Mark
8(c)	2 Na + **F_2** → **2** NaF (2) F_2 (1) 2 (1)		**(2)**

Question number	Answer	Mark
8(d)(i)	An answer that provides a description by making reference to: • one electron (transferred) (1) • transferred from sodium to fluorine (1)	**(2)**

Question number	Answer	Mark
8(d)(ii)	An explanation that combines identification - understanding (1 mark) and reasoning/justification - understanding (1 mark): • (both solid and molten) contained charged particles/ions (1) • (ions) free to move in molten but not in solid (1)	**(2)**

Question number	Answer	Mark
8(e)(i)	any value between 30 (°C) and 63 (°C)	**(1)**

Question number	Answer	Mark
8(e)(ii)	potassium / rubidium / caesium / francium	**(1)**

(Total for Question 8 = 11 marks)

Question number	Answer	Mark
9(a)(i)	value in the range 64 - 66 (s)	**(1)**

Question number	Answer	Mark
9(a)(ii)	all magnesium is used up	**(1)**

Question number	Answer	Additional guidance	Mark
9(a)(iii)	volume of hydrogen = 48 (1) rate = $\frac{48}{20}$ (1) = 2.4 ($cm^3\ s^{-1}$)	2.4 only (2) incorrect volume/20 1 mark only	**(2)**

Question number	Answer	Mark
9(a)(iv)	curved line to the left of curve (1) same final volume (which is the maximum volume) (1)	**(2)**

Question number	Answer	Mark
9(a)(v)	**C** no change, no change	**(1)**

Question number	Indicative content	Mark
*9(b)	Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlines in the generic mark scheme. The indicative content below is not prescriptive and candidates are not required to include all the material which is indicated as relevant. Additional content included in the response must be scientific and relevant. **method** • measure volume of acid • measure mass of marble chips • mix • in a suitable container e.g. flask / boiling tube / test tube • collect the gas • in a {gas syringe/measuring cylinder over water/ burette over water / graduated tube over water} • measure volume of carbon dioxide • measure time • repeat experiment with different size marble chips • same mass of marble chips • same volume of acid • same concentration of acid • same temperature accept alternative method involving measurements of mass loss **results** • smaller chips (of marble) have a more vigorous reaction ORA • smaller chips take less time to {react/produce a certain volume of gas /have a certain mass loss} ORA • shorter time means faster reaction ORA	(6)

Level	Mark	Descriptor
	0	• No rewardable material.
Level 1	1-2	• Demonstrates elements of chemical understanding, some of which is inaccurate. Understanding of scientific, enquiry, techniques and procedures lacks detail. (AO1) • Presents a description which is not logically ordered and with significant gaps. (AO1)
Level 2	3-4	• Demonstrates chemical understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas, enquiry, techniques and procedures is not fully detailed and/or developed. (AO1) • Presents a description of the procedure that has a structure which is mostly clear, coherent and logical with minor steps missing. (AO1)
Level 3	5-6	• Demonstrates accurate and relevant chemical understanding throughout. Understanding of the scientific ideas, enquiry, techniques and procedures is detailed and fully developed. (AO1) • Presents a description that has a well-developed structure which is clear, coherent and logical. (AO1)

(Total for Question 9 = 13 marks)

Question number	Answer	Mark
10(a)(i)	An answer that provides a description by making reference to: • dip clean wire into hydrochloric acid (1) • dip wire into solid (1) • put wire in a {roaring/blue/non-luminous} flame (1)	(3)

Question number	Answer	Additional guidance	Mark
10(a)(ii)	yellow		(1)

Question number	Answer	Additional guidance	Mark
10(b)	An answer that provides a description by making reference to: • add (dilute) hydrochloric acid (1) • add barium chloride solution (1) • white precipitate forms (1)	3rd marking point consequential on 2nd marking point	(3)

Question number	Answer	Additional guidance	Mark
10(c)	114.78 - 111.23 (1) = 3.55 50 cm^3 solution contain = 3.55g sodium sulfate(1) 1000 cm^3 solution contains = $\frac{3.55 \times 1000}{50}$ g (1) concentration = 71 g dm^{-3} (1)	allow full marks for correct answer with no working	(4)

(Total for Question 10 = 11 marks)