



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CHEMISTRY

0620/32

Paper 3 Theory (Core)

May/June 2016

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 will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2016 series for most Cambridge IGCSE[®], Cambridge International A and AS Level components and some Cambridge O Level components.

© IGCSE is the registered trademark of Cambridge International Examinations.

This syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **9** printed pages.



Page 2	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – May/June 2016	0620	32

Question	Answer	Marks
1(a)(i)	B and D;	1
1(a)(ii)	C; has only one type of atom;	2 1 1
1(a)(iii)	Na ₃ P;	1
1(b)(i)	16;	1
1(b)(ii)	5;	1
1(b)(iii)	60;	1
1(c)	acidic; because phosphorus is a non-metal/it is a non-metal oxide/it would react with bases/neutralises bases/ phosphorus is on the right-hand side of the Periodic Table;	2 1 1

Page 3	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – May/June 2016	0620	32

Question	Answer	Marks
2(a)	lead < nickel < zinc < titanium; (1 mark if one pair reversed)	2
2(b)	positive electrode: oxygen / O ₂ ; negative electrode: aluminium / Al;	1 1 2
2(c)	test: (aqueous) sodium hydroxide / (aqueous) ammonia; result: (grey-) green precipitate / solid;	1 1 2
2(d)(i)	oxygen / air; water;	1 1 2
2(d)(ii)	idea of covering surface with tin / zinc / other suitable metal / plastic / grease / oil / paint / galvanising; prevents oxygen / air or water / moisture / steam from getting to the surface;	1 1 2

Page 4	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – May/June 2016	0620	32

Question	Answer	Marks
3(a)	reversible reaction / equilibrium;	1
3(b)	exothermic and products have less energy than reactants;	1
3(c)(i)	percentage yield decreases as temperature increases;	1
3(c)(ii)	91%;	1
3(d)	test: (acidified) potassium manganate(VII)/potassium permanganate; result: (pink solution) turns colourless;	2 1 1
3(e)	any suitable use, e.g. food preservation / manufacture of sulfuric acid;	1
3(f)	sulfur dioxide; (sulfur dioxide) loses oxygen;	2 1 1
3(g)	3 (H ₂ O);	1

Page 5	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – May/June 2016	0620	32

Question	Answer	Marks
4(a)	any 2 from: - family/group of similar chemicals; - with same functional group; - trend in physical properties; - same general formula; - same/similar chemical reaction; - successive members differ by CH₂;	2
4(b)(i)	F and G; contain <u>only</u> carbon and hydrogen; have <u>only</u> single bonds/no double bonds;	3 1 1 1
4(b)(ii)	F / methane / CH ₄ ;	1
4(b)(iii)	H; J;	2 1 1
4(b)(iv)	contain oxygen;	1
4(c)(i)	ethanol;	1
4(c)(ii)	yes and because there is a general increase in the numbers/the numbers go up steadily; OR no and because the numbers go down then up again;	1
4(c)(iii)	65°C;	1
4(d)(i)	2 (CO); 3 (H ₂ O);	2 1 1
4(d)(ii)	poisonous/toxic;	1

Page 6	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – May/June 2016	0620	32

Question	Answer	Marks
5(a)	liquid; 6°C is higher than the melting point and lower than the boiling point/6 °C is between the melting point and boiling point;	2 1 1
5(b)(i)	potassium chloride; iodine;	2 1 1
5(b)(ii)	<u>iodine</u> is less reactive than <u>bromine</u> / <u>bromine</u> is more reactive than <u>iodine</u> ;	1
5(c)	357 (1 mark for 1 correct row, e.g. $(4 \times 16 =) 64$ or $(2 \times 35.5) = 71$)	2
5(d)(i)	cross shown on baseline;	1
5(d)(ii)	ethanol / other organic solvent;	1
5(d)(iii)	dyes <u>move up</u> the paper and <u>separate</u> ;	1

Page 7	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – May/June 2016	0620	32

Question	Answer	Marks
6(a)	any 5 from: • conducts electricity / conducts heat; • soft; • solid; • shiny (when cut); • malleable / ductile; • reacts with water to produce hydrogen; • bubbles / fizzes in water; • vigorous reaction with water; • floats on water / low density; • forms an alkaline solution with water; • reacts with oxygen / air to form an oxide; • reacts with chlorine to form a chloride; • suitable word equations (maximum two equations);	5
6(b)	test: put the sodium compound on <u>nichrome</u> / <u>platinum wire</u> (on the edge of a blue Bunsen burner flame); result: flame goes yellow;	2 1 1
6(c)(i)	pH 13;	1
6(c)(ii)	add (red) litmus to sodium hydroxide / dip (red) litmus into sodium hydroxide; turns blue;	2 1 1
6(d)	sulfur dioxide produced / SO_2 formed; causes breathing difficulties / harmful to eyes / coughing / damages lungs / irritates eyes / sore throat / skin burns / difficulty swallowing / headache / vomiting;	2 1 1

Page 8	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – May/June 2016	0620	32

Question	Answer	Marks
7(a)	flask; (gas) syringe;	2 1 1
7(b)(i)	1.0 (mol/dm ³) because the initial gradient is steeper/initial slope is steeper;	1
7(b)(ii)	steeper gradient than curve for 1.0 mol/dm ³ ; same final volume;	2 1 1
7(c)	any suitable use, e.g. fuel/reducing agent/making margarine/making ammonia/Haber process/fuel cells;	1
7(d)	dust has a (very) high surface area;	1

Page 9	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – May/June 2016	0620	32

Question	Answer	Marks
8(a)	<u>mixture</u> of 2 or more metals / <u>mixture</u> of a metal and a non-metal;	1
8(b)	any alloy, e.g. brass, bronze etc.;	1
8(c)	any 4 from: • solder has melted; • atoms in solid (only) vibrate; • atoms in solid are regularly arranged / touching / close to each other; • atoms start to vibrate more; • atoms in liquid are irregularly arranged / close together / touching; • atoms in liquids slide over each other / atoms in liquids move slowly; • atoms move more during melting; • atoms become less regularly arranged during melting;	4
8(d)	vapour <u>spreads</u> everywhere / vapour <u>does not stay in one place</u> ;	1