

MARK SCHEME for the October/November 2013 series

0652 PHYSICAL SCIENCE

0652/61

Paper 6 (Alternative to Practical), maximum raw mark 60

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.

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- 1 (a) 36 ;
44.5 ;
51 ; (no tolerance)
- (b) 80(°C) ; [1]
- (c) *best* metal
plastic
worst glass ; [1]
- (d) (i) thickness (of the wall / material) ; [1]
- (ii) any 2:
same volume of water (in bottle) ;
same shape ;
same size bottle ;
same temperature of water in bottle ;
same amount of stirring ; [max 2]
- (e) (i) electrons ; [1]
- (ii) (electrons) in covalent (bonds) ; [1]
- [Total: 10]
- 2 (a) (i) 67.8 ;
62.9 ; (no tolerance) [2]
- (ii) $67.8 - 45 = 22.8$ (ecf) ;
 $62.9 - 25 = 37.9$ (ecf) ; [2]
- (iii) $22.8/45 = 0.51$ (ecf) ;
 $37.9/25 = 1.52$ (ecf) ; [2]
- (b) (i) points plotted ± 1 small square ; (*allow 1 error*)
best straight line drawn ; [2]
- (ii) clear evidence shown on graph ;
14.5 – 15.5 (ecf) ; [2]
- [Total: 10]

Page 3	Mark Scheme	Syllabus
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- 3 (a) (i) limewater becomes cloudy/milky/white ppt/white solid forms ;
(ii) carbon dioxide/CO₂ ;
(iii) solid X is a (metal) carbonate or hydrogen carbonate (bicarbonate); [1]
- (b) diagram shows filter funnel containing paper and collecting vessel ;
any two relevant labels ; [2]
- (c) (i) copper(II) hydroxide (allow copper hydroxide) ; [1]
(ii) (dark) blue solution (both words necessary) ; [1]
- (d) (i) (blue solution) becomes colourless/green (solution) ; [1]
(ii) (grey) filings become copper coloured/pink/brown/orange ; [1]
- (e) copper(II) carbonate (allow copper carbonate) **AND** CuCO₃ (both correct) ; [1]
- [Total: 10]**

- 4 (a) (i) 31.3 ; [1]
(ii) red to blue/purple (NOT blue to red) ; [1]
- (b) the acid was (completely) neutralised ;
sodium sulfate is neutral (has a pH of 7) ;
sodium hydrogensulfate is acid ; [max 2]
- (c) same volume of acid and alkali ;
without indicator ;
evaporate ;
filter ;
dry crystals with eg filter paper ;
(any 4)
OR
evaporate ;
(heat/boil) to concentrate/crystallisation point/saturation etc. ;
leave to cool ;
filter ;
dry crystals with e.g. filter paper ;
(any 4) [max 4]
- (d) add less sodium hydroxide ;
add half the volume/amount/ 10 cm³ ; [2]
- [Total: 10]**

Page 4	Mark Scheme	Syllabus
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- 5 (a) magnesium ;
silicon ;
- (b) phosphorus
sodium ; (must be in correct order) [1]
- (c) (element number 17) (chlorine) is yellow / green / not colourless / is coloured ; [1]
- (d) include the sample in an electrical circuit / try to make it conduct electricity ;
observation: bulb lights up / ammeter shows a reading ; [2]
- (e) (i) blue ; [1]
(ii) to dissolve / make a solution ; [1]
(iii) red / pink / orange ; (*accept yellow*) [1]
(iv) blue / indigo / violet ; (*accept dark green*) [1]
- [Total: 10]**

- 6 (a) 0.26 A ;
1.55 V ; [2]
0.30 A ;
1.80 V ; all 2dp, penalise once [2]
- (b) (i) $1.55/0.26 = 6.0$ (ecf) ;
 $1.80/0.30 = 6.0$ (ecf) ; [2]
- (ii) voltage is read to the nearest 0.05 V, giving a possibility of inaccuracy / the wire heats up ; [1]
- (iii) find the average / plot a graph and find the gradient ; [1]
- (c) (i) electrons ; [1]
(ii) arrow shown pointing from left to right on the resistance wire ; [1]
- [Total: 10]**