CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2013 series

0652 PHYSICAL SCIENCE

0652/61 Paper 6 (Alternative to Practical), maximum raw mark 60

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1 **(a)** 36 ;
44.5 ;
51 ; (no tolerance) [3]

(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]

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3 **(a)** **(i)** limewater becomes cloudy / milky / white ppt / white solid forms ; [1]

(ii) carbon dioxide / CO_2 ; [1]

(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** $CuCO_3$ (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 ;
<u>evaporate</u> ;
filter ;
dry crystals with eg filter paper ;
(any 4)
OR
<u>evaporate</u> ;
(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 cm^3 ; [2]

[Total: 10]

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5 **(a)** magnesium ;
silicon ; [2]

(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]

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