

## **MARK SCHEME for the May/June 2014 series**

### **0653 COMBINED SCIENCE**

**0653/52**

Paper 5 (Practical), maximum raw mark 30

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 2014 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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- 1 (a) purple/pink **AND** due to pH above 8/alkaline conditions ;
- (b) (i) row or column for **A** and **B** ;  
row or column for recording time with suitable units (in heading or with each reading) ; [2]
- (ii) results recorded for both blocks (neither greater than 5400s/90 min) ;  
block **B** has shorter time ; [2]
- (c) acid diffuses (into agar) ;  
pH is reduced/ acid neutralizes alkali/ it becomes neutral ; [max 1]
- (d) different volumes of acid ;  
use the same volume/amount ;  
**OR**  
difficult to judge the end point ;  
(so) repeat and calculate a mean/ time to whole block colourless ;  
**OR**  
difficult to cut blocks evenly/ dimensions not accurate ;  
(so) have a guide to help cutting/ use moulds for **A** and **B** ;  
(to award second mark the improvement must match a stated inaccuracy) any pair [max 2]
- (e) (i) reduction in distance for diffusion/ **B** is a smaller block ;  
increase in surface area to volume ratio ; [max 1]
- (ii) different sized blocks/ greater range of block sizes/ another size of block ; [1]
- [Total: 10]**
- 2 (a) (i) blue/ blue-green/ green ; [1]
- (ii) *observation* : no reaction (allow grey ppt) ;  
*conclusion* : not chloride/ not  $Cl^-$  ; [2]
- (iii) *observation* : white ppt ;  
*conclusion* : sulfate/  $SO_4^{2-}$  ; [2]

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- (b) (i) brown ppt / brown solid / brown suspension / insoluble brown ;  
(allow red-brown ppt)
- (ii) *colour of filtrate* : (dark) blue ;  
*colour of residue* : brown / red-brown / black / green ; [2]
- (iii) *cation in filtrate* :  $\text{Cu}^{2+}$  / copper (not Cu) ;  
*cation in residue* :  $\text{Fe}^{3+}$  / iron(III)  
**OR**  
*cation in residue* :  $\text{Fe}^{2+}$  / iron(II) if residue in (b) (ii) is green ; [2]

[Total: 10]

- 3 (a) (i) *I* value recorded ;  
*V* value recorded ; [2]
- (ii) A / amp(ere) ; [1]
- (iii) *I* values all recorded ;  
*I* values < 1 A and to at least two decimal places ;  
*V* values all < 2.5 V and to at least one decimal place ;  
*V* values decreasing down table ; [4]
- (b) (i) all *P* values correct ;  
values decreasing down Table 3.1 ; [2]
- (ii) the lamp gets dimmer (as *l* increases) ; [1]

[Total: 10]