ISEB
Independent Schools Examinations Board

COMMON ENTRANCE EXAMINATION AT 13+

SCIENCE

LEVEL 2

CHEMISTRY

MARK SCHEME

Specimen Paper

(for first examination in Autumn 2017)

This is a suggested, not a prescriptive, mark scheme.

28315SM31

Q.	Answer	Mark	Additional Guidance
1. (a)	carbon	**5**	
(b)	a compound		
(c)	decomposition		
(d)	copper		
(e)	the molecules in ice are further apart than those in liquid water		
2. (a) (i)	H_2SO_4	**1**	accept formula in any order, e.g. SO_4H_2 etc.
(ii)	1-2	**1**	
(b)	red	**1**	
(c) (i)	neutralisation	**1**	
(ii)	sodium sulfate	**1**	accept 'sodium sulphate'!
(d)	turns blue/purple	**1**	
3. (a) (i)	open	**1**	
(ii)	good amount of air/oxygen	**1**	
(b)	carbon dioxide	**1**	
	water	**1**	
(c) (i)	middle part cool/no combustion	**1**	
	outer part hot/gas burning	**1**	
(ii)	two regions of glow move closer	**1**	
	brightest glow at top of cone	**1**	
	glow gets less bright when raised higher	**1**	
(d)	copper oxide	**1**	
4. (a) (i)	permanent ink is insoluble in water	**1**	
(ii)	to stop solvent evaporating	**1**	accept safety reason, e.g. fumes, flammability
(b) (i)	pencil does not smudge/dissolve	**1**	
(ii)	so ink does not dissolve into solvent below	**1**	

Q.	Answer	Mark	Additional Guidance
(c)	two purple dyes have similar solubility in ethanol/ ethanol does not separate them	**1** **1**	
(d)	propanone inks are more soluble in propanone moved further up the filter paper	**1** **1** **1**	
5. (a)	*in order:* prediction method observation measurement explanation	**4**	4 marks for all five correct 3 marks for three correct 2 marks for two correct 1 mark for one correct
(b)	all the magnesium was used up	**1**	
(c)	207.6 − 206.9 = 0.7 g	**2**	award 1 mark for correct working, if answer incorrect award 1 mark for answer 0.4 g (using figures from diagram) instead of table
(d)	magnesium + hydrochloric acid → magnesium chloride + hydrogen	**1** **1**	1 mark for magnesium chloride 1 mark for rest correct
(e)	*precaution:* e.g. wear goggles *reason:* e.g. acid harmful to eyes	**1** **1**	accept any sensible precaution with correct reason
6. (a)	The water acts as a **solvent** dissolving the salt to make a **solution**. The sand is **insoluble** and when the mixture is filtered, it remains as a **residue** on the filter paper.	**4**	
(b)	boil the solution until all water evaporated/solid remains	**1** **1**	
(c)	distillation	**1**	

Q.	Answer	Mark	Additional Guidance
(d)	e.g. use equal amounts of mixture use same volume of water weigh filter papers filter through separate filter papers wash with water dry filter papers weigh each filter paper to see which contains most sand	**4**	1 mark for general method 1 mark for fair testing 1 mark for logical sequence 1 mark for precision in answer allow method involving timing how quickly the filtration occurs
7. (a)	particles close together moving randomly	**1** **1**	
(b) (i)	evaporation	**1**	accept 'boiling'
(ii)	particles further apart in gas	**1**	
(c) (i)	diffusion	**1**	
(ii)	particles moving in all directions and spreading	**1** **1**	
(iii)	particles collide with air particles	**1**	
Total		**60**	