Independent Schools Examinations Board

COMMON ENTRANCE EXAMINATION AT 13+

SCIENCE

LEVEL 2

CHEMISTRY

MARK SCHEME

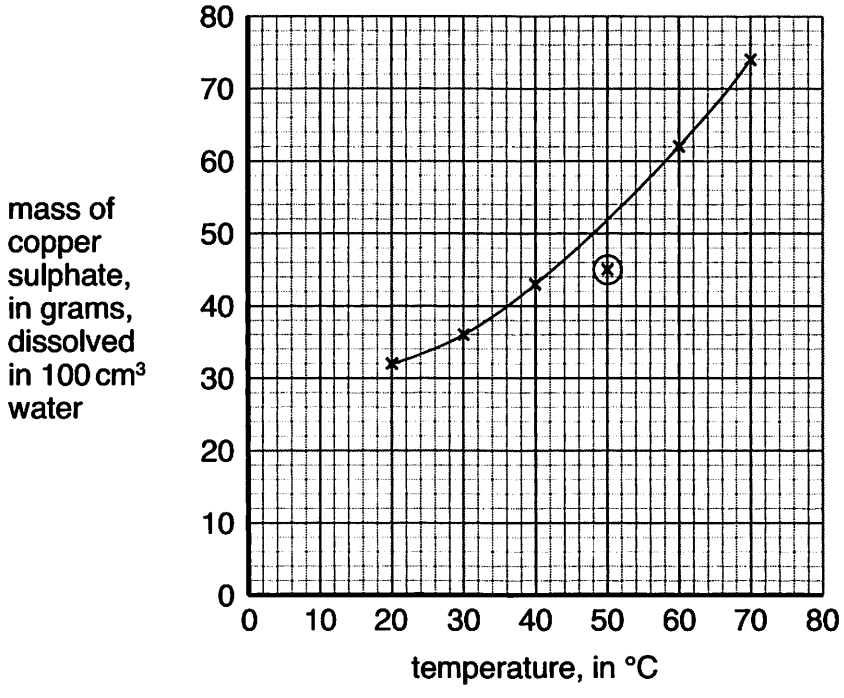
This is a suggested, not a prescriptive, mark scheme.

Tuesday 28 January 2014

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Q.	Answer	Mark	Additional Guidance
1. (a)	nitrogen	7	
(b)	oxygen		
(c)	increase		
(d)	a compound		
(e)	filtrate		
(f)	decomposition		
(g)	Na		
2. (a)	X: (round bottomed) flask Y: thermometer Z: (Liebig) condenser	3	
(b)	(simple) distillation	1	
(c)	100 °C	1	both figure and unit needed
(d)	both evaporate together/alcohol and water have close boiling points	1	
3. (a) (i)	1–6	1	
(ii)	8–14	1	
(b) (i)	neutralisation	1	
(ii)	sodium hydroxide + hydrochloric acid → sodium chloride + water	3	1 mark for both reactants 1 mark for each product
(c)	Universal Indicator solution/paper check colour against pH chart	2	accept answer involving pH meter
(d) (i)	volume of sodium hydroxide	1	
(ii)	any value greater than 7, up to 14	1	
(e) (i)	alkali/sodium hydroxide	1	
(ii)	20 cm^3 of alkali needed to neutralise 10 cm^3 acid – therefore alkali more dilute	1	

Q.	Answer	Mark	Additional Guidance
4. (a)	carbon and hydrogen	1	both needed – no extras
(b)	carbon dioxide	1	
	water	1	
(c)	carbon monoxide formed	2	
	which is toxic		
(d)	weigh the canister first	2	
	weigh at end of day; take difference		
(e)	particles get further apart	2	
	particles move faster		
(f)	C_4H_{10}	1	
5. (a) (i)	proper scale added AND labelled	1	
(ii)		2	2 marks for all 6 points plotted accurately 1 mark for 3, 4 or 5 points plotted accurately
(iii)	point at 50 °C circled	1	
(iv)	best fit line drawn – must be a curve	1	

Q.	Answer	Mark	Additional Guidance
(b)	solubility increases with increasing temperature reference to curved nature of graph/ solubility increases by greater amounts at higher temperature etc.	**2**	
(c) (i) (ii)	56–58 grams equivalent to 40 grams per 100 cm^3 36 °C	**1** **2**	check with graph check with graph
(d)	blue solution blue (undissolved) solid (at the bottom)	**2**	
6. (a)	unreactive with water strong malleable/flexible/bendable	**2**	any two points
(b)	strong cheap low reactivity/does corrode but can be protected	**2**	any two points
(c)	zinc more reactive than iron/physical barrier prevents body corroding	**2**	
(d)	unreactive – no reaction with water malleable/flexible	**2**	any sensible alternative
7. (a)	chromatography	**1**	
(b)	*diagram or description should contain:* spots of ink both from note and suspects' pens on chromatography paper solvent allow to soak up paper note/measure height of spots compare with ransom note ink neat, correct diagram	**4**	to achieve 4 marks, account must give clear explanation of how the suspect's pen ink is linked to ink from the ransom note
Total		**60**	