

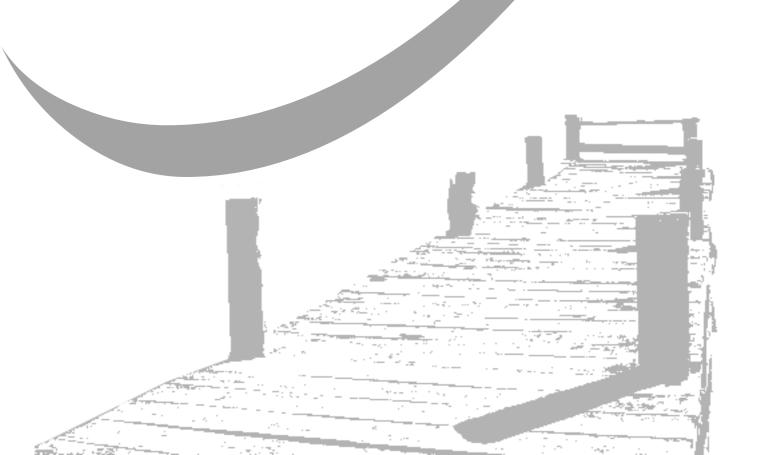
GCE AS and A Level

Chemistry

AS exams 2009 onwards A2 exams 2010 onwards

Unit 3X: EMPA Specimen mark scheme

Version 1.0





General Certificate of Education

Chemistry 1421/2421

CHM3X Externally Marked Practical
Assignment (EMPA) Board
Assessed Unit

Marking Guidelines

Specimen Paper

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TASK 1

Points assessed from Candidate Results Sheet Task 1.

(a)	the recording of results	resu	Its recorded clearly in a sensible table	1
(b)	the accuracy of the observati	ons.	22 scoring points 19 - 22 points scores 15 - 18 points scores 11 - 14 points scores 6 - 10 points scores 1 - 5 points scores	5 4 3 2 1

Total 6 marks

Task 1

l				
Observation with Al ³⁺	no visible change (1)	white ppt (1) soluble in excess or colourless solution (1)	white ppt (1)	white ppt (1) effervescence (1)
Observation with Ba ²⁺	white ppt (1)	no visible change (1)	no visible change (1)	white ppt (1)
Observation with Ca^{2+}	white ppt (1)	white ppt (1)	white ppt (1)	white ppt (1)
Observation with ${ m Mg}^{2+}$	no visible change (1)	white ppt (1)	white ppt (1)	white ppt (1)
Observation with varnish stripper	white ppt (1)	no visible change (1)	no visible change (1)	white ppt (1)
Test	1 Addition of sulphuric acid	2 Addition of sodium hydroxide solution	3. Addition of ammonia solution	4. Addition of sodium carbonate solution

TASK 2

Р	oints assessed	from	Candidate	Regulte	Sheet '	Tack 2
	UII II aaacaacu	HUHH	Calluluate	IVESUITS	JIIGGL	Iask Z.

(a)	the recording of results recorded clearly in sensible table	1
(b)	awareness of precision temperatures recorded appropriately and consistently	1
(c)	The accuracy of the temperature rise, measured against a teacher value	
	temperature rise is within 3% of target value temperature rise is within 5% of target value temperature rise is within 8 % of target value temperature rise is within 10 % of target value	4 3 2 1

Total 6 marks

Section A

Question 1

Ba ²⁺	1	
hite ppt with H₂SO₄/ no visible change with NaOH/ no visible change with NH₃ ny two		
Question 2		
plots points correctly	1	
line through the points before addition is smooth	1	
line through the points after addition is smooth	1	
hest fit	1	

extrapolates points before addition correctly extrapolates points after addition correctly reads the temperature rise correctly from the graph

Total 10 marks

1 1

Section B Question 3 Draws a straight line which passes through origin Ignores point at 0.25g **Question 4** Uses the graph to determine the mass to form 1.000g 1 1.20g **Question 5** Calculate the number of moles in 1.000g of BaCl₂ 4.80 x 10⁻³ 1 **Question 6** Calculate the M_r of BaCl₂.xH₂O 250.0 1 M_r to 1 dec place **Question 7** 1 Calculate the degree of hydration, x 2(.32) **Question 8** Calculates the percentage error in using the balance 4% 1 **Question 9** 1 x likely to be a whole number so precision less important **Question 10** 1 wear gloves/ flood with water if alkali in contact with skin **Question 11** (a) yes / good straight line / can use with confidence 1 (b) anomalous result at 0.25 g **Question 12** 1 ensure reaction complete/ ensure all water lost

Question 13				
calculations	difference percentage		1 1	
Question 14				
(a) % errors in weighing are too large with 0.100g(b) may not decompose fully				
Question 15				
white precipitate			1	
Question 16				
barium sulphate insoluble			1	
Question 17				
100%			1	
Question 18				
first result was anomalous several results will identify anomalies 1				

Section C

aqueous bromine (orange to)colourless solution

Question 19			
add solution to a 250 cm3 volumetric/ graduated flask with washings make up to the mark shake well to mix	1 1 1		
Question 20			
volume of reagents used lagging/ lid/ air space around calorimeter	1		
Question 21			

Total 8 marks

1 1