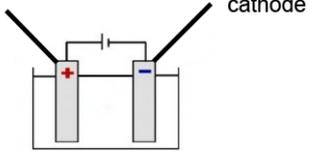


Mark scheme – Electrolysis (F)

Question			Answer/Indicative content	Marks	Guidance
1			A	1 (AO2.2)	
			Total	1	
2			B	1 (AO2.2)	Examiner's Comments Candidates found this difficult and all responses were seen; D being the most common.
			Total	1	
3	i		ionic✓ oppositely charged ions✓	2 (AO1.1)	ALLOW oppositely charged particles / has + and – particles IGNORE contains anions and cations (in diagram) IGNORE oppositely charged atoms / molecules DO NOT ALLOW positive nucleus and negative electrons Mark independently
	ii		Any two from: Idea of many strong ✓ covalent bonds ✓ (which) require a lot of energy to break ✓	2 (AO1.1)	Reference to intermolecular forces / bonds / molecular forces scores 0 for question ALLOW many covalent bonds break at high temperatures for 2 marks ALLOW idea that each atom has 4 strong covalent bonds for 2 marks ALLOW giant covalent structure for 1 mark
	iii		No delocalised electrons / no sea of electron / no mobile charge carriers / ions / electrons structure contains atoms ✓	1 (AO1.1)	IGNORE just free electrons
			Total	5	

4	a	i	anode 	2 (AO2 × 1.2)	All correct = 2 marks 1 or 2 correct = 1 mark						
		ii	Positive electrode: bromine ✓ Negative electrode: lead ✓	2 (AO2 × 2.2)	DO NOT ALLOW bromide ALLOW reversed 1 mark						
		iii	PbBr ₂ ✓	1 (AO2.1)							
	b	i	All points plotted correctly scores 2 mark ✓✓ Straight line of best fit through the points ✓	3 (AO2 × 2.2 1.2)	ALLOW ± ½ square 3 or 4 points plotted correctly scores 1 mark ALLOW correctly drawn line of best fit through incorrectly drawn points; this may be a curve						
		ii	0.72 (A) ✓	1 (AO3.1a)	ALLOW answer in the range 0.70 A – 0.74 A / ecf						
		iii	FIRST CHECK ANSWER ON ANSWER LINE If answer = 47(g) award 2 marks 5A = 15.5(g) = 15.5 × 3 = 46.5(g) ✓ = 47(g) (2 sig. figs) ✓	2 (AO2.1 1.2)	ALLOW 1.0 A = 3.1 (g) (from graph or table) 10(A) = 31(g) and 5 (A) = 1.55 (g) ✓ 15(A) = 31 + 1.55 = (46.5) 47 (g) ✓						
		Total		11							
5	a		<table border="1"> <thead> <tr> <th>Positive ions (cations)</th> <th>Negative ions (anions)</th> </tr> </thead> <tbody> <tr> <td>Na⁺</td> <td>Cl⁻ (1)</td> </tr> <tr> <td>H⁺ (1)</td> <td>OH⁻</td> </tr> </tbody> </table>	Positive ions (cations)	Negative ions (anions)	Na ⁺	Cl ⁻ (1)	H ⁺ (1)	OH ⁻	2	
Positive ions (cations)	Negative ions (anions)										
Na ⁺	Cl ⁻ (1)										
H ⁺ (1)	OH ⁻										
	b		Volume = 0.564 ³ (1) = 0.179406144 (1) to 3 significant figures = 0.179 (1)	3	ALLOW 3 marks for 0.179 without any working out						
		Total		4							