

Electrolysis (including of aqueous solutions, half-equations)

A1. (2018)

01.8	dissolved		1	AO1 5.2.2.3
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A2. (2018)

01.9	<div> <div>Statement</div> <div>Reason</div> <div> <div>Solid sodium chloride does not conduct electricity</div> <div>Molten sodium chloride conducts electricity</div> </div> <div> <div>The ions are fixed</div> <div>The ions are mobile</div> <div>The ions are neutral</div> <div>The ions are vibrating</div> </div> </div>	do not accept if more than 1 line from 1 box	1 1	AO1 5.2.2.3
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A3. (2018)

05.1	chlorine		1	AO2 5.4.3.4
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A4. (2019)

02.4	(negative electrode) copper	allow Cu	1	AO2 5.4.3.2
	(positive electrode) chlorine	allow Cl ₂ / Cl do not accept chloride or Cl ⁻ if no other mark awarded allow 1 mark if elements are reversed	1	

A5. (2019)

02.5	a reading of an increase in mass	} e.g. 4 (mg) in 10 (mins) scores 2 marks	1	AO2 5.4.3.4
	correct linked reading of the increase in time		1	
	correct evaluation of gradient	e.g. ($\frac{4}{10}$) 0.4 (mg per min) allow correct calculation of gradient from incorrectly determined values for mass and/or time	1	

A6. (2019)

02.6	cryolite	this order only	1	AO1 5.4.3.3
	oxide		1	

A7. (2020)

06.3		allow anode for (positive) electrode	1	AO1 5.4.3.1 5.4.3.2 5.4.3.3
	(at high temperature) oxygen reacts with carbon / electrode		1	
	(so the positive) electrode burns / wears away to produce carbon dioxide	C + O ₂ → CO ₂ scores MP1 and MP3	1	

A8. (2020)

06.4	(delocalised) electron(s)		1	AO1
	ion(s)		1	AO2
	(delocalised) electron(s)		1	AO1
				5.2.2.3 5.2.2.8 5.2.3.2

A9. (2021)

02.1	molten		1	AO2 5.2.3.2 5.4.3.1 5.4.3.2
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A10. (2021)

02.2	opposite (charges) attract or (the ions) are negative(ly charged)		1	AO1 5.4.3.1 5.4.3.4 RPA9
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A11. (2021)

02.3	water		1	AO1 5.4.3.4
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A12. (2021)

02.4	Cu ²⁺		1	AO2 5.4.3.1 5.4.3.4 RPA9
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A13. (2021)

02.5	(positive electrode) bubbles / effervescence / fizzing	allow gas (is produced)	1	AO3 5.4.3.1 5.4.3.4 RPA9
	(negative electrode) (pink / orange / red / brown) solid	allow copper (plating) allow metal for solid	1	

A14. (2022)

A)

06.2	(volume of hydrogen) 30 (cm ³) and (volume of oxygen) 15 (cm ³)		1	AO2 5.4.3.4 RPA9
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B)

06.3	(because) the ratio of volume of hydrogen : oxygen is 2 : 1		1	AO3 5.4.3.4 RPA9
	(and this is the) same as the ratio of hydrogen (atoms) : oxygen (atoms) in (formula of) H ₂ O		1	
	OR			
	(because) the ratio of volume of hydrogen : oxygen is not 2 : 1 (1)	must relate to the volumes given in question 06.2		
	(and this is) different to the ratio of hydrogen (atoms) : oxygen (atoms) in (formula of) H ₂ O (1)			

A15. (2023)

04.1	electrons		1	AO1 5.2.2.8
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A16. (2023)

04.2	(water →) hydrogen (ion) + hydroxide (ion)		2	AO1 5.4.3.4
		allow for 1 mark hydrogen (ion)		
		allow for 1 mark hydroxide (ion)		

A17. (2023)

04.4	(copper ions) are positive(ly charged)		1	AO1 5.4.3.1 5.4.3.4 RPA9
	(so are) attracted (to the negative electrode)		1	

A18. (2023)

04.5	discharged		1	AO1 5.4.3.1 5.4.3.4 RPA9
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A19. (2023)

04.6	increases		1	AO2 5.4.3.1 5.4.3.4 RPA9
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A20. (2023)

04.7	bromine		1	AO2 5.4.3.1 5.4.3.4 RPA9
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A21. (2024)

05.2	MgCl ₂ (l)		1	AO2 5.1.1.1 5.2.2.2
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A22. (2024)

05.3	(negative electrode) magnesium	allow Mg	1	AO2 5.4.3.1 5.4.3.2
	(positive electrode) chlorine	allow Cl ₂	1	
		allow 1 mark if both elements are reversed		