

ELECTROLYSIS OF AQUEOUS SOLUTIONS

MARK SCHEME

Compound dissolved in water	+ive ions in the solution	-ive ions in the solution	Products formed at the +ive electrode	Products formed at the -ive electrode	Half equation for +ive electrode	Half equations for -ive electrode	Ions left in the solution	Marks
NaCl	Na ⁺ H ⁺	Cl ⁻ OH ⁻	Chlorine Cl ₂	Hydrogen H ₂	2Cl ⁻ → Cl ₂ + 2e ⁻	2H ⁺ + 2e ⁻ → H ₂	Na ⁺ OH ⁻	7
CuSO₄	Cu ²⁺ H ⁺	SO ₄ ²⁻ OH ⁻	Oxygen O ₂	Copper Cu	4OH ⁻ → O ₂ + 2H ₂ O + 4e ⁻	Cu ²⁺ + 2e ⁻ → Cu	H ⁺ SO ₄ ²⁻	7
CaBr₂	Ca ²⁺ H ⁺	Br ⁻ OH ⁻	Bromine Br ₂	Hydrogen H ₂	2Br ⁻ → Br ₂ + 2e ⁻	2H ⁺ + 2e ⁻ → H ₂	Ca ²⁺ OH ⁻	7
AgNO₃	Ag ⁺ H ⁺	NO ₃ ⁻ OH ⁻	Oxygen O ₂	Silver Ag	4OH ⁻ → O ₂ + 2H ₂ O + 4e ⁻	Ag ⁺ + e ⁻ → Ag	H ⁺ NO ₃ ⁻	7
H₂SO₄	H ⁺	SO ₄ ²⁻ OH ⁻	Oxygen O ₂	Hydrogen H ₂	4OH ⁻ → O ₂ + 2H ₂ O + 4e ⁻	2H ⁺ + 2e ⁻ → H ₂	H ⁺ SO ₄ ²⁻	7
Pb(NO₃)₂	Pb ²⁺ H ⁺	NO ₃ ⁻ OH ⁻	Oxygen O ₂	Lead Pb	4OH ⁻ → O ₂ + 2H ₂ O + 4e ⁻	Pb ²⁺ + 2e ⁻ → Pb	H ⁺ NO ₃ ⁻	7
CuCl₂	Cu ²⁺ H ⁺	Cl ⁻ OH ⁻	Chlorine Cl ₂	Copper Cu	2Cl ⁻ → Cl ₂ + 2e ⁻	Cu ²⁺ + 2e ⁻ → Cu	H ⁺ OH ⁻	7
PtSO₄	Pt ²⁺ H ⁺	SO ₄ ²⁻ OH ⁻	Oxygen O ₂	Platinum Pt	4OH ⁻ → O ₂ + 2H ₂ O + 4e ⁻	Pt ²⁺ + 2e ⁻ → Pt	H ⁺ SO ₄ ²⁻	7
HNO₃	H ⁺	NO ₃ ⁻ OH ⁻	Oxygen O ₂	Hydrogen H ₂	4OH ⁻ → O ₂ + 2H ₂ O + 4e ⁻	2H ⁺ + 2e ⁻ → H ₂	H ⁺ NO ₃ ⁻	7
NaOH	Na ⁺ H ⁺	OH ⁻	Oxygen O ₂	Hydrogen H ₂	4OH ⁻ → O ₂ + 2H ₂ O + 4e ⁻	2H ⁺ + 2e ⁻ → H ₂	Na ⁺ OH ⁻	7
KNO₃	K ⁺ H ⁺	NO ₃ ⁻ OH ⁻	Oxygen O ₂	Hydrogen H ₂	4OH ⁻ → O ₂ + 2H ₂ O + 4e ⁻	2H ⁺ + 2e ⁻ → H ₂	H ⁺ NO ₃ ⁻	7
FeCl₃	Fe ³⁺ H ⁺	Cl ⁻ OH ⁻	Chlorine Cl ₂	Hydrogen H ₂	2Cl ⁻ → Cl ₂ + 2e ⁻	2H ⁺ + 2e ⁻ → H ₂	Fe ³⁺ OH ⁻	7

Ca(NO₃)₂	Cu ²⁺ H ⁺	NO ₃ ⁻ OH ⁻	Oxygen O ₂	Copper Cu	4OH ⁻ → O ₂ + 2H ₂ O +4e ⁻	Cu ²⁺ + 2e ⁻ → Cu	H ⁺ NO ₃ ⁻	7
Al₂(SO₄)₃	Al ³⁺ H ⁺	SO ₄ ²⁻ OH ⁻	Oxygen O ₂	Hydrogen H ₂	4OH ⁻ → O ₂ + 2H ₂ O +4e ⁻	2H ⁺ + 2e ⁻ → H ₂	H ⁺ SO ₄ ²⁻	7