A Level Chemistry 9701 data and formulas

Exams in 2025, 2026 and 2027 · From the official Cambridge syllabus · Paper 3 / 4 / 6 = only on that paper

Values printed in the exam

Molar gas constant	$R = 8.31\ J\ K^{-1}\ mol^{-1}$
Faraday constant	$F = 9.65 \times 10^{4}\ C\ mol^{-1}$
Avogadro constant	$L = 6.022 \times 10^{23}\ mol^{-1}$
Charge on an electron	$e = -1.60 \times 10^{-19}\ C$
Molar volume of gas	$22.4\ dm^3\ mol^{-1}$ at s.t.p.; $24.0\ dm^3\ mol^{-1}$ at room conditions
Ionic product of water	$K_w = 1.00 \times 10^{-14}\ mol^2\ dm^{-6}$ at 298 K
Specific heat capacity of water	$c = 4.18\ J\ g^{-1}\ K^{-1}$

AS: learn these

Amount of substance	$n = m \div M$
Concentration	$c = n \div V$
Ideal gas equation	$pV = nRT$
Energy change	$q = mc\Delta T$, $\Delta H = -mc\Delta T \div n$
Partial pressure	partial pressure = mole fraction × total pressure
Equilibrium constants	K_c from concentrations, K_p from partial pressures

A Level: learn these

Entropy change	$\Delta S^\circ = \Sigma S^\circ(\text{products}) - \Sigma S^\circ(\text{reactants})$
Gibbs free energy	$\Delta G = \Delta H - T\Delta S$, $\Delta G = -nE^\circ_{cell}F$
Cell potential	$E^\circ_{cell} = E^\circ(\text{positive electrode}) - E^\circ(\text{negative electrode})$
Nernst equation	$E = E^\circ + (0.059/z)\ \log([\text{oxidised}] \div [\text{reduced}])$
Electrolysis	$Q = It$, $F = Le$
Acids	$pH = -\log[H^+]$, $K_a = [H^+][A^-] \div [HA]$, $pK_a = -\log K_a$
Rate equation	$\text{rate} = k[A]^m[B]^n$; first order: $t_{½} = 0.693 \div k$
Carbon atoms from mass spectrum	$n = 100 \times \text{abundance}[M+1]^+ \div (1.1 \times \text{abundance } M^+)$

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