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Conductance and Kohlrausch law

Formulas and units, JEE Main. Status: Reviewed on 2026-11-20.

Result	Formula	Units or note
Conductance	G = 1/R Valid when: any conductor at fixed temperature	S (ohm^-1)
Conductivity	kappa = G* / R = G* x G, with G* = l/A Valid when: uniform cell; measured with alternating current	S cm^-1 (1 S cm^-1 = 100 S m^-1)
Cell constant	G* = kappa x R Valid when: same cell and solution; conductivity in S cm^-1	cm^-1
Molar conductivity	Lambda_m = 1000 kappa / c (c in mol L^-1) Valid when: c in mol L^-1; kappa in S cm^-1	S cm^2 mol^-1 (1 S m^2 mol^-1 = 10^4 S cm^2 mol^-1)
Strong electrolyte	Lambda_m = Lambda0 - A sqrt(c) Valid when: strong electrolyte, dilute solution	S cm^2 mol^-1
Kohlrausch's law	Lambda0 = nu+ lambda0(+) + nu- lambda0(-) Valid when: at infinite dilution, ions move independently	S cm^2 mol^-1
Degree of dissociation	alpha = Lambda_m / Lambda0 Valid when: weak electrolyte, dilute solution	dimensionless
Ka of weak acid	Ka = c alpha^2 / (1 - alpha) Valid when: weak monobasic acid, 1:1 electrolyte, dilute	mol L^-1
Sparingly soluble salt	S = 1000 kappa(salt) / Lambda0 Valid when: Saturated solution of a sparingly soluble salt; Lambda_m taken as Lambda0 (infinite dilution); kappa(water) subtracted	mol L^-1

Full lesson with worked examples:
https://www.engineeringrise.in/learn/learn/jee-main/chemistry/redox-reactions-and-electrochemistry/conductance-and-kohlrausch-la

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