EngineeringRise

Polarization

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

Result	Formula	Units or note
Unpolarised light through a polaroid	I = I0/2 Valid when: unpolarised light passing through an ideal polaroid	W/m^2
Malus law	I = I0 cos^2(theta) Valid when: plane-polarised light; theta between polarisation and axis	W/m^2
Amplitude through a polaroid	A = A0 cos(theta) Valid when: plane-polarised light; theta between polarisation and axis	same as A0
Brewster law (air to medium)	tan(i_B) = n Valid when: light going from air to medium of index n, reflected light	dimensionless
Brewster law (medium 1 to 2)	tan(i_B) = n2/n1 Valid when: light going from medium 1 to medium 2, reflected light	dimensionless
Angle relation at Brewster angle	i_B + r = 90 degrees Valid when: at the Brewster angle; reflected and refracted rays are perpendicular	degrees
Three polaroids, crossed ends	I = (I0/8) sin^2(2 theta) Valid when: unpolarised light, first and third axes crossed, middle at theta to first	W/m^2
Chain of polaroids	I = (I0/2) x product of cos^2(theta_k) Valid when: unpolarised light then ideal polaroids; theta_k is angle between neighbouring axes	W/m^2

Full lesson with worked examples: https://www.engineeringrise.in/learn/learn/jee-main/physics/optics/polarization

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