

Er:YAP crystals

Yttrium aluminium oxide YAlO₃ (YAP) is an attractive laser host for erbium ions due to its natural birefringence combined with good thermal and mechanical properties similar to those of YAG. Er:YAP crystals with high doping concentration of Er³⁺ ions are typically used for lasing at 2,73 microns. Low-doped Er:YAP laser crystals are used for of the eye-safe radiation at 1,66 microns by in-band pumping with semiconductor laser diodes at 1,5 microns. The advantage of such a scheme is low thermal load corresponding to low quantum defect.



Basic properties	
Compound Formula	YAlO ₃
Molecular Weight	163.884
Appearance	Translucent crystalline solid
Melting Point	1870 °C
Boiling Point	N/A
Density	5.35 g/cm ³
Crystal Phase / Structure	Orthorhombic
Refractive Index	1.94-1.97 (@ 632.8 nm)
Specific Heat	0.557 J/g·K
Thermal Conductivity	11.7 W/m·K (a-axis), 10.0 W/m·K (b-axis), 13.3 W/m·K (c-axis)
Thermal Expansion	2.32 x 10 ⁻⁶ K ⁻¹ (a-axis), 8.08 x 10 ⁻⁶ K ⁻¹ (b-axis), 8.7 x 10 ⁻⁶ K ⁻¹ (c-axis)