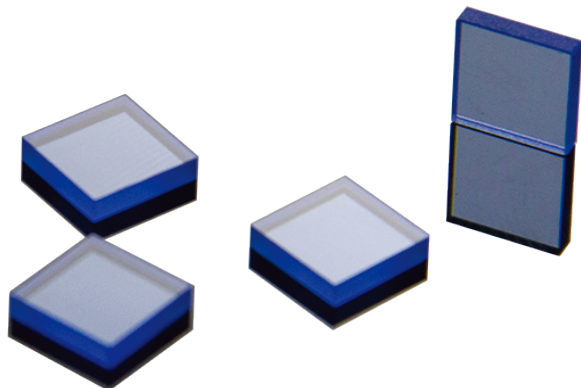


Co:Spinel

Co²⁺:MgAl₂O₄



Description

Passive Q-switches or saturable absorbers generate high power laser pulses without the use of electro-optic Q-switches, thereby reducing the package size and eliminating a high voltage power supply. Spinel is a hard, stable crystal that polishes well. Cobalt substitutes readily for magnesium in the Spinel host without the need for additional charge compensation ions.

Features

- Suitable for 1540 nm eye-safe lasers
- High absorption section
- Negligible excited state absorption
- High optical quality
- Uniformly distributed Co

Specifications

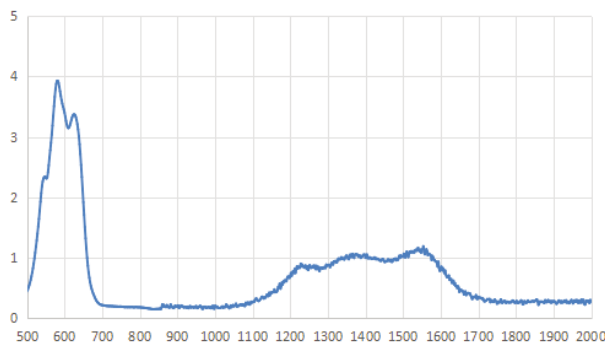
Property	Value
Concentrations	(0.05~0.35) wt%
Absorption coefficient	0 ~ 7 cm ⁻¹
Ground-state absorption cross-section $\sigma_{GSA}(E-19 \text{ cm}^2)$	2.8 (± 0.4) @1340nm
Excited state absorption cross-section $\sigma_{ESA}(E-20 \text{ cm}^2)$	2.0 (± 0.6) @1340nm
Ground-state absorption cross-section $\sigma_{GSA}(E-20 \text{ cm}^2)$	3.5 (± 0.4) @1540nm

Applications

- Eye-safe 1540 nm Er:glass laser
- 1440 nm laser
- 1340 nm laser
- Eye-safe laser range finder

Parameters

Property	Value
Chemical formula	Co ²⁺ :MgAl ₂ O ₄
Crystal structure	Cubic
Lattice parameters	8.07Å
Density	3.62 g/cm ³
Melting Point	2105°C
Refractive Index	n=1.6948 @1.54 μm
Thermal Conductivity/(W·cm ⁻¹ ·K ⁻¹ @25°C)	0.033W
Thermal Expansion / (10 ⁻⁶ /°C@25°C)	1.046
Specific Heat/ (J·g ⁻¹ ·K ⁻¹)	5.9
Hardness (Mohs)	8.2
Extinction Ratio	25dB
Orientation	[100] or [111] < $\pm 0.5^\circ$
Optical density	0.1-0.9
Damage Threshold	> 500 MW/cm ²
Doping concentration of Co ²⁺	0.01-0.3 atm%



Absorption Spectrum of Co:Spinel crystal

Property	Value
Excited state absorption cross-section $\sigma_{ESA}(E-20 \text{ cm}^2)$	1.0 (± 0.6) @1540nm
Working wavelength	1200 - 1600 nm
End Configuration	Flat/Flat
Figure of Merit(FOM)	100~300
Coatings	AR/AR@1540, R<0.2%; AR/AR@1340, R<0.2%