

Co:Spinel / Cr⁴⁺:YAG – PASSIVE Q-SWITCHING CRYSTALS



Cr⁴⁺:YAG crystals

Fe:ZnSe, Cr:ZnSe, Co:ZnS solid-state saturable absorbers also are available upon request

Co:Spinel (Co²⁺:MgAl₂O₄) is a relatively new material for passive Q-switching in lasers emitting from 1.2 to 1.6 μm, in particular, for eye-safe 1.54 μm Er:glass laser, but also works at 1.44 μm and 1.34 μm wavelengths. High absorption cross section ($3.5 \times 10^{-19} \text{ cm}^2$) permits Q-switching of Er:glass laser without intracavity focusing both with flash-lamp and diode-laser pumping. Negligible excited-state absorption results in high contrast of

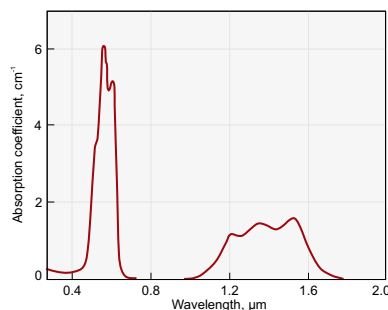


Fig. 1. Absorption spectra of the Co:Spinel crystal

Q-switch, i.e. the ratio of initial (small signal) to saturated absorption is higher than 10 (Fig. 1). Cr⁴⁺:YAG is one of the best passive Q-switch for high power lasers emitting at ~1 μm wavelength. Standard diameter apertures – 5, 8, 9.5 mm and various initial transmission (or optical density) are available upon request. Also Cr⁴⁺:YAG laser rods for ultra-short pulse solid-state lasers are available.

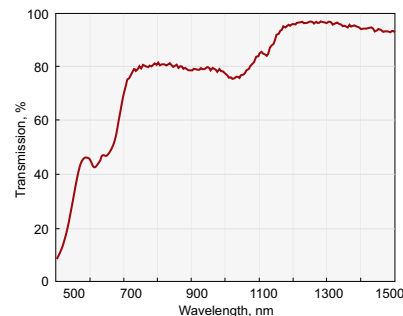


Fig. 2. Transmission of AR coated at 1064 nm Cr:YAG Q-switch with initial transmission of 80% at 1064 nm

Specifications

	Co:Spinel	Cr ⁴⁺ :YAG
Working wavelength range, μm	1.2 – 1.6	0.8 – 1.2
Ground state absorption cross section, cm ²	3.5×10^{-19} (at 1.54 μm)	5×10^{-18} (at 1.06 μm)
Excited state absorption cross-section, cm ²	–	7×10^{-19} (at 1.06 μm)
Initial transmittance, %	30 – 99	20 – 99
Transmission tolerances	±2 %	±2 %
Wavefront distortion	<λ/10 @ 632.8 nm	<λ/8 @ 632.8 nm
Diameter tolerances	+0.0 / -0.2 mm	+0.0 / -0.2 mm
Parallelism error	< 20 arcsec	≤ 30 arcsec
Perpendicularity	< 5 arcmin	≤ 15 arcsec
Surface quality	10 – 5 scratch & dig (per MIL-O-13830A)	20 – 10 scratch & dig (per MIL-O-13830A)
Chamfer	<0.1 mm @ 45°	<0.1 mm @ 45°
AR Coating reflectivity	<0.2 % @ 1540 nm	<0.2 % @ 1064 nm

Standard Cr⁴⁺:YAG Crystals

Initial Transmission, %	Diameter, mm	Catalogue number	Price, EUR
20	7	CrYAG-07-20	130
30	7	CrYAG-07-30	130
35	7	CrYAG-07-35	130
40	7	CrYAG-07-40	130
45	7	CrYAG-07-45	130
50	7	CrYAG-07-50	130
65	7	CrYAG-07-65	130
70	7	CrYAG-07-70	130
80	7	CrYAG-07-80	130
85	7	CrYAG-07-85	130

Standard Co:Spinel Crystals

Initial Transmission, %	Diameter, mm	Catalogue number	Price, EUR
30	5	CoMALO-05-30	725
40	5	CoMALO-05-40	725
50	5	CoMALO-05-50	725
60	5	CoMALO-05-60	725
70	5	CoMALO-05-70	725
80	5	CoMALO-05-80	725
90	5	CoMALO-05-90	725