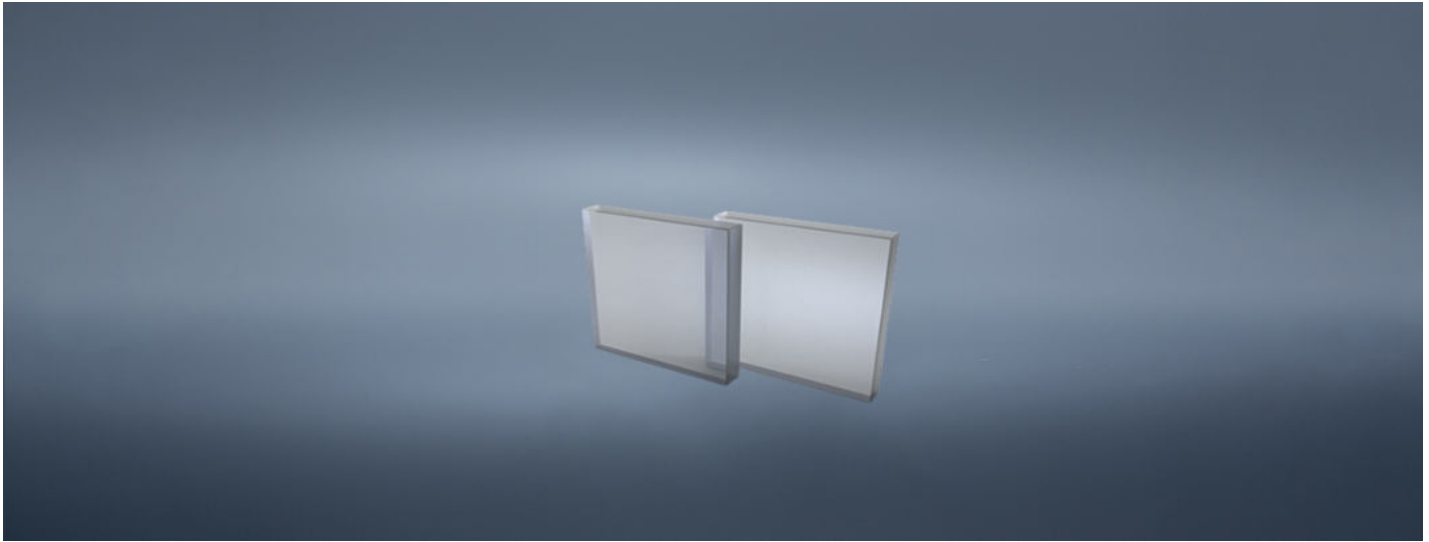


Er,Yb:YAB



DESCRIPTION

CRYLINK's erbium, ytterbium co-doped aluminum borate yttrium crystal products, also known as Er,Yb:YAB. It is a kind of laser glass product with excellent comprehensive performance. It is widely used in telecommunication system, radar monitoring and laser field. The product is characterized by high thermal conductivity, high absorption and emission cross sections, and wide absorption bandwidth. It can be used in ultra-short mode-locked lasers, laser radar, passive Q-switched lasers, eye safety (1.5-1.6 μm) laser products.

FEATURES

- High thermal conductivity
- Wide absorption bandwidth near 976 nm
- High absorption and emission cross-sections
- A uniaxial crystal having a triangular structure
- Extremely high energy transfer efficiency from Yb³⁺ to Er³⁺

APPLICATIONS

- Ultra-short mode-locked lasers for telecommunication systems
- High power eye safe ($\sim 1.5 \mu\text{m}$) continuous wave laser metering
- High repeat frequency passively adjusted Q laser for lidar and LIBS systems



Er,Yb:YAB

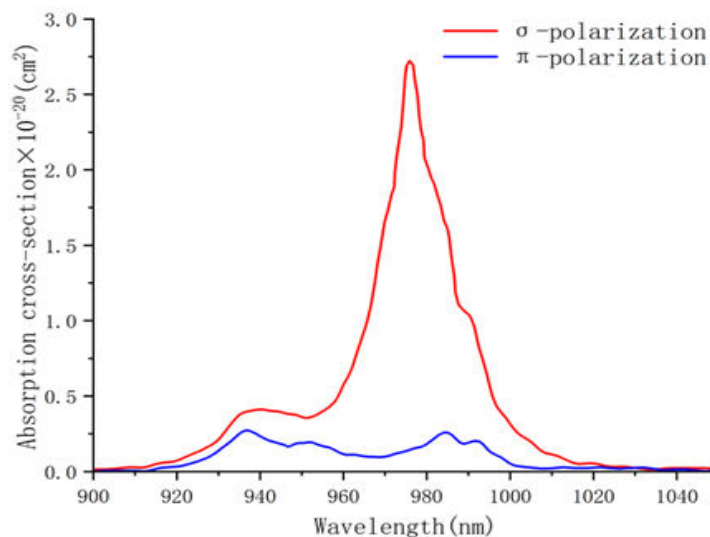
SPECTROSCOPIC AND THERMO-MECHANICAL PROPERTIES

Absorption peak wavelength	976 nm
Absorption cross-section at peak wavelength	$2.7 \times 10^{-20} \text{ cm}^2$
Absorption Bandwidth at peak wavelength	17 nm
Laser wavelength	1522, 1531, 1543, 1550, 1602 nm
Lifetime of $4I_{13/2}$ erbium energy level	0.32 ms
Emission cross-section@1531 nm	$2.5 \times 10^{-20} \text{ cm}^2$
Yb to Er energy transfer efficiency	>90 %
Refractive index@632.8 nm	$n_o=1.7757, n_e=1.7015$
Crystal structure	Trigonal
Density	3.84 g/cm ³
Mohs hardness	7.5
Thermal conductivity	7.7 (//a), 6 (//c) Wm ⁻¹ K ⁻¹
dn/dT	1.4×10^{-6} (//a), 4.8×10^{-6} (//c) K ⁻¹
Thermal expansion coefficient	2×10^{-6} (//a), 9.5×10^{-6} (//c) K ⁻¹
Typical doping level	1-2 at.% [Er] 8-15 at.% [Yb]

STANDARD SPECIFICATIONS

Er, Yb:YAB Crystal	
Orientation	c-cut
Clear aperture	>90%
Face dimensions tolerance	+0,0/-0,1 mm
Length tolerance	±0,1 mm
Parallelism error	<10 arcsec
Perpendicularity error	<10 arcmin
Protective chamfers	<0,15 mm at 45°
Surface quality	10-5 S-D
Surface flatness	< $\lambda/10$ @632,8 nm
Coatings	AR@($R < 1\%$) @940 nm + AR($R < 0,25\%$) @1480-1600 nm
Laser-induced damage threshold	>10 J/cm ² @1550 nm, 10 ns

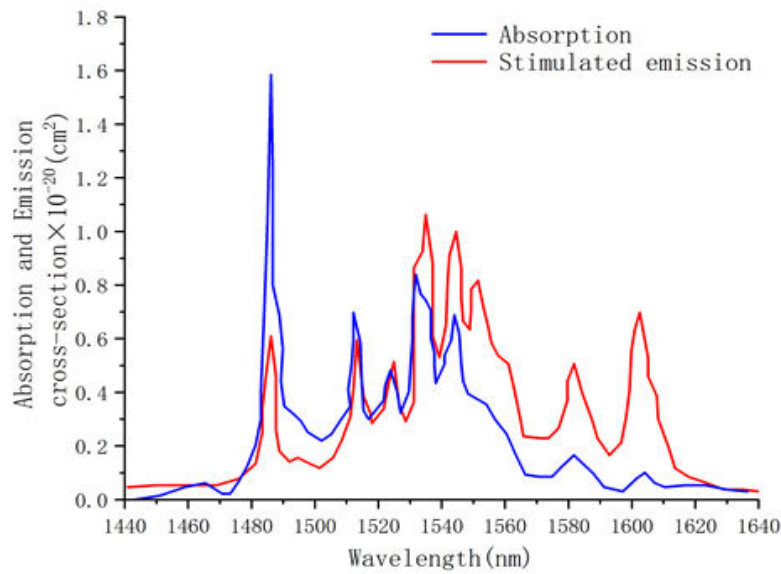
SPECTROGRAM



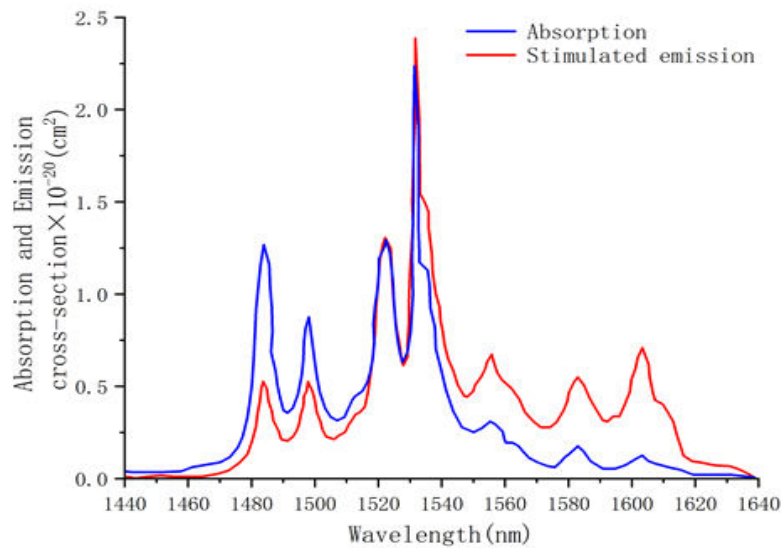
π and σ polarization absorption cross section spectra of Er, Yb:YAB crystals at room temperature in the 900-1050 nm wavelength range



Er, Yb:YAB



π polarization absorption and emission cross sections of Er, Yb:YAB crystals in the wavelength range of 1.5-1.6 μm at room temperature



σ polarization absorption and emission cross sections of Er, Yb:YAB crystals in the wavelength range of 1.5-1.6 μm at room temperature

