Er:YAP

DESCRIPTION

Emission and excitation spectra of Er-doped YAP crystals reveal a broad emission band in the eyesafe region with peaks around 1545-nm and 1608-nm and pump-bands suitable for common 800-nm and 970-nm diode lasers, suggesting YAP as a candidate crystalline host for diode-pumped laser in the 1.5-μm eye-safe regime. Yttrium aluminum perovskite (YAP) is expected to be suitable host material for efficient laser emission owing to higher thermal conductivity (～13.3 W m^{-1} K^{-1}) good mechanical properties, and lower photon energy compared to YAG, Y_2O_3, and Lu_2O_3) , Er: YAP exhibits the large emission cross-section in 3 μm, which was three times larger than that of Er: YAG. Highly doped Er:YAP can emit 2.73μm wavelength laser, and lowly doped Er:YAP crystal emits 1.66μm laser. Moreover, Er:YAP is one of the most promising laser materials, and can provide high-power mid-IR coherent beam.

FEATURES

- Higher thermal conductivity
- Lower phonon energy
- Good mechanical properties
- Abundant energy level structure
- High doping concentration

APPLICATIONS

- Eyesafe Glass
- high-power mid-IR coherent beam

PARAMETERS

OPTICAL AND SPECTRAL PROPERTIES

Laser Transition	$^4S_{3/2} \rightarrow {}^4I_{9/2}$	$^4I_{11/2} \rightarrow {}^4I_{13/2}$
Laser Wavelength	1.66 μm	2.73 μm
Pump Belt	0.6-0.8 μm	1.53 μm
Emission Cross Section	3 μm	
Refractive Index	1.94-1.97 (@ 632.8 nm)	

Er:YAP

PHYSICAL AND CHEMICAL PROPERTIES

Chemical Formula	Er:$YAlO_3$
Crystal Structure	Rhombic Crystals-Pbnm
Molecular Mass	163.884
Shape	Translucent Crystalline Solid
Direction	b axis-Pbnm
Melting Point	1870 °C
Density	5.35 g/cm^3
Specific Heat Capacity	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)
Coefficient of 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)
Precise Quality	163.872 g/mol
Single Isotope Mass	163.872 g/mol

SPECTRA