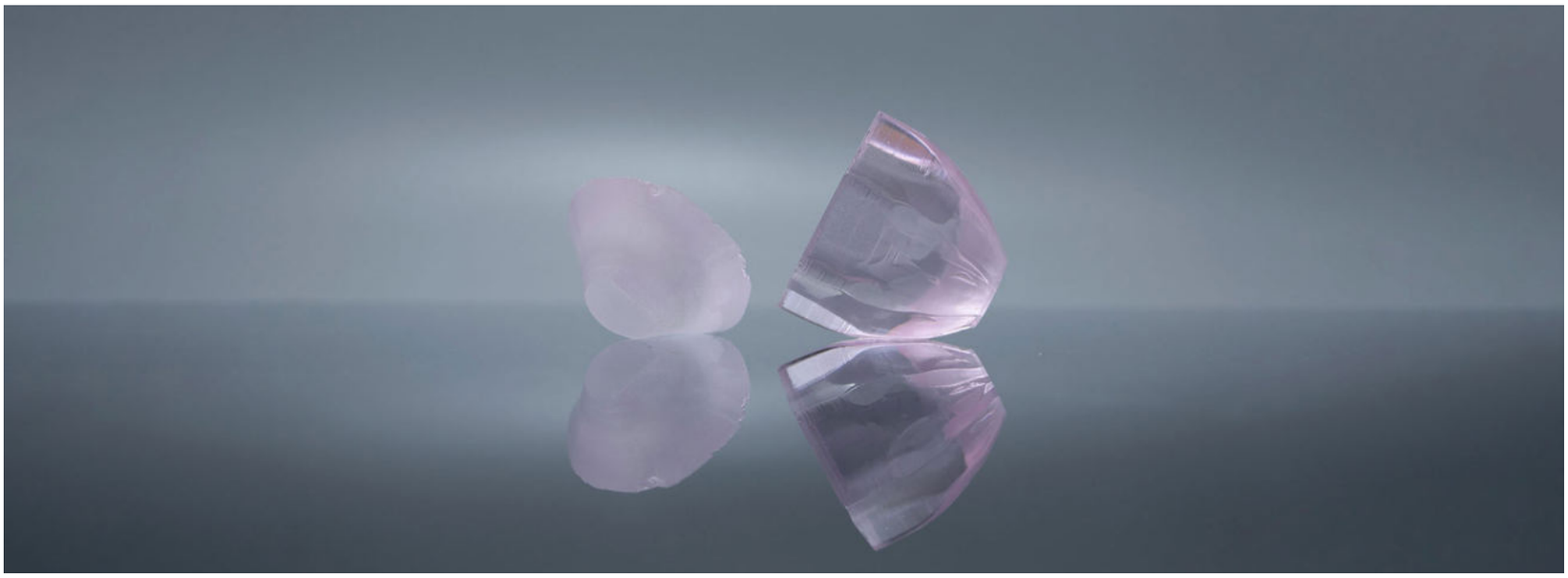
Er:YAP



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 eyesafe 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, Y2O3, and Lu2O3) , 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

APPLICATION

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

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PARAMETER

Physical and Chemical Properties

Chemical Formula	Er:YAlO3
Crystal Structure	orthorhombic – Pbnm
Molecular Weight	163.884
Appearance	Translucent crystalline solid
Crystallographic Orientation	b-axis ref. to Pbnm convention
Melting Point	1870 °C
Density	5.35 g/cm3
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)
Exact Mass	163.872 g/mol
Monoisotopic Mass	163.872 g/mol

Optical and Spectral Properties

Laser Transition	4S3/2→4I9/2	4I11/2→4I13/2
Laser Wavelength	1.66 μm	2.73 μm
Pump bands	0.6-0.8 μm	1.53 μm
Refractive Index	1.94-1.97 (@ 632.8 nm)	
Emission cross-section	3 μm	

SPECTRA