

Er:Cr:YSGG

Introduction

Er:Cr:YSGG (Erbium, Chromium doped Yttrium Scandium Gallium Garnet) provides an efficient laser crystal for generating 2800nm light in an important water absorption band. It becomes one of the most promising laser crystals recently owing to its high conversion efficiency, stable chemical properties, long fluorescent lifetime. Now Er:Cr:YSGG is widely used in dentistry, environmental researching, optical communication, remote sensing technology and military etc.

Advantages of Er:Cr:YSGG

- Lowest threshold and highest slope efficiency of common Erbium doped crystals;
- High conversion efficiency;
- Operates CW, free-running or Q-switched;
- High optical quality;
- The intrinsic crystal disorder increases pump line widths and tenability;
- Can be flash lamp pumped via Cr bands or diode pumped via Er bands;
- Long fluorescent lifetime.

Table1. Basic Properties of Er:Cr:YSGG

Crystal structure:	Cubic, Garnet
Growth Method:	Czochralski
Chemical formula:	$Y_{2.93}Sc_{1.43}Ga_{3.64}O_{12}$
Lattice constant:	12.42 Å
Doping content(at/cm ³):	Cr: 0.5×10^{20} , Er: 4×10^{21}
Density:	5.67g/cm ³ (Cr & Er doped)
Refractive index:	1.92 at 1000nm
Thermal expansion coefficient:	8.1×10^{-6} /K
Thermal conductivity (W/mK):	8
Hardness (Mohs) :	8
Thermo-optical factor(dn/dT)(10 ⁻⁶ /K):	12.3
Emission cross-section(cm ²):	5.2×10^{-21}
Fluorescent Lifetime:	1400 μs

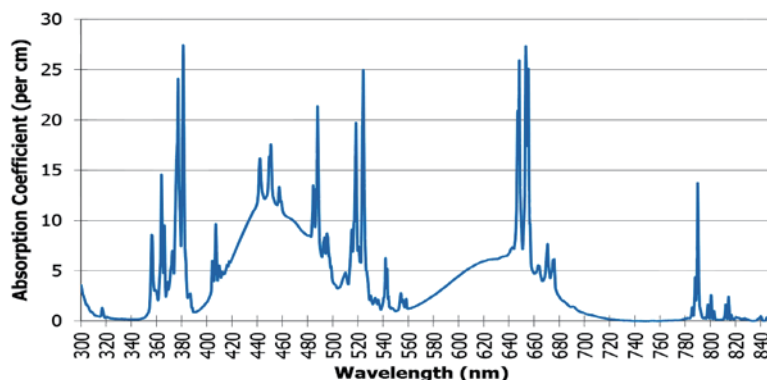


Figure1. Cr:Er:YSGG Absorption Coefficient