

Yb:KGW

Introduction

Ytterbium doped Potassium-Gadolinium Tungstate crystals - (Yb:KGd(WO₄)₂ or Yb:KGW) is an excellent laser gain material which has important advantages over the widely used Nd³⁺ doped materials. Its broad spectral emission band 1023-1060nm allows the generation of short (ps or fs) laser pulses. Its wide absorption spectrum at 980 nm and high absorption of pump radiation allow an efficient use of diode laser pumping. Compared with YAG used as hosts for Yb³⁺, KGW has the advantage of larger absorption cross section, which decreases the minimum pump intensity necessary to achieve transparency in the quasi-two-level system of ytterbium.

Basic Properties:

Crystal structure	monoclinic
Point group	C2/c
Cell Parameters	a = 8.09Å; b = 10.43Å; c = 7.588Å β = 94.4°
Refractive index, at 1067 nm	n _q = 2.033; n _p = 2.037; n _m = 1.986
Mohs hardness	5
Density, g/cm ³	7.27
Melting Point	1075°C
Thermal conductivity at 373K, W x cm ⁻¹ x K ⁻¹	K _[100] = 0.026; K _[010] = 0.038; K _[001] = 0.034
Thermal expansion coefficient, at 373K	α _[100] = 4 x 10 ⁻⁶ K ⁻¹ ; α _[010] = 1.6 x 10 ⁻⁶ K ⁻¹ ; α _[001] = 8.5 x 10 ⁻⁶ K ⁻¹
Lasing Wavelength	1023-1060nm
Absorption band	981nm (FWHM 3.7nm)
Fluorescent lifetime	600 μs (5% doping)

Specifications of Yb:KGW

Orientation	[010]
Standard Dopant concentration (at. %)	5%
Maximum length	50mm
Length tolerance, mm	+1.0 / -0.0
Diameter tolerance, mm	+/-0.1
Parallelism	< 30''
Perpendicularity	< 15'
Surface quality	20/10
coating	AR-coated