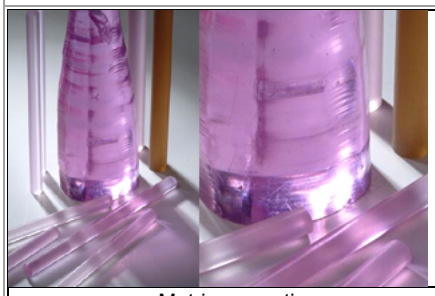
Text:

ALEXANDRITE (optical)

BERYLLATE LANTHANUM



Single-crystals of $La_2Be_2O_5:Nd^{3+}$ are highly effective material for solid-state lasers oscillating at the wavelength of 1,07 – 1,08 mm. Energetic characteristics of a lanthanum-beryllate laser are twice greater as those of an yttrium-aluminium garnet ($Y_3Al_5O_{12}:Nd^{3+}$) laser and are not inferior to those of a GSGG ($Gd_3Se_2Ga_3O_{12}:Cr^{3+},Nd^{3+}$) laser. It operates well in the mode of picosecond pulses at a pulse duration of 3 – 5 ps with an efficiency several times higher as that of YAG.

Rods with round cross-sections are manufactured.

Matrix properties	
Mean dislocation density (cm^{-2})	100
Molecular weight	375,82
Syngony	monoclinic
Class of symmetry	$2m\text{-}c_2k_6$
Spatial group	C2 / C1
Elementary cell parameters (Å)	a = 7,5356 b = 7,3476 c = 7,4387
Density (g/cm^3)	6,061

Microsolidity (kg/mm^2):
// a
// b
// c
	
	890
	890
	810

Melting point (°C)	1361
Axial characteristic	biaxial
Refraction indeces	N_x = 1,9641 N_y = 1,9974 N_z = 2,0348
Moh's hardness	6,5
Characteristics of crystal	
Nd^{3+} concentration (at.%)	1 – 5
Wavelength of oscillation (μm)	1,07 – 1,08
Transition cross-section (cm^2)	$1{,}5\times10^{-19}$
Absorption loss on λ = 1060 nm (cm^{-1})	0,004
Oscillation boundaries depending on Nd^{3+} concentration and orientation (J) (lasing thresholds as a function of Nd^{3+} concentration and orientation (J))	3 – 12
Specification of laser rods (sizes and processing)	
Diameter tolerance (mm)	± 0,1
Length tolerance (mm)	± 0,5
End faces are unparallel	10″
Surface quality	10-5 scratch-dig
Flatness	λ/10
Orientation tolerance	< 5°
Diameter (mm)	4 – 12
Length (mm)	50 – 100

GADOLINIUM VANADATE (with Neodim)

- Vanadate Yttrium
- Yttrium Orthovanadate (doped with Erbium and Ytterbium)
- Yttrium Orthovanadate (monocrystal)
- Hexaaluminate Beryllium
- Titan–Sapphire
- Forsterite
- Spinel
- Alexandrite (jewellery)
- Ruby
- Tanzanion