

Physical Properties

Chemical Formula	$\text{LiY}_{1.0-x}\text{Nd}_x\text{F}_4$
Lattice Parameters	$a=5.16$; $c=10.85$
Crystal structure	tetragonal
Space Group	$14_1/a$
Nd atoms/cm ³	1.40×10^{20} atoms/cm ³ For 1% Nd doping
Knoop hardness	300kg /mm ²
Melting Point	819 °C
Density	3.99g /cm ³
Modulus of Elasticity	85GPa
Thermal Expansion	$8.3 \times 10^{-6}/\text{k}$ along c axis
Coefficient	$13.3 \times 10^{-6}/\text{k}$ along c axis
Thermal Conductivity	0.063 W/cm K
Specific Heat	0.79 J/g K

Optical Properties

Transparency Region	180nm to 6.7μm
Peak Stimulated Emission	$1.8 \times 10^{-19} \text{cm}^2$ (E C) at 1.047μm
Cross Section	$1.2 \times 10^{-19} \text{cm}^2$ (E ⊥ C) at 1.053μm
Spontaneous Fluorescence	485μs for 1% Nd
Scatter Losses	<0.2%/cm
Peak Absorption Coefficient	$\alpha = 10.8 \text{cm}^{-1}$ (792.0 nm E C)
(for 1.2% Nd)	$\alpha = 3.59 \text{cm}^{-1}$ (797.0 nm E ⊥ C)
Sellmeier Equation	$n_o^2 = 1.38757 + \frac{0.70757 \lambda^2}{\lambda^2 - 0.00931} + \frac{0.18849 \lambda^2}{\lambda^2 - 50.99741}$ $n_e^2 = 1.31021 + \frac{0.84903 \lambda^2}{\lambda^2 - 0.00876} + \frac{0.53607 \lambda^2}{\lambda^2 - 134.9566}$