



Nd:MDT

monoclinic double tungstate



Nd³⁺ doped KGW single crystals are known for their high efficiency (3-5 times higher than Nd:YAG lasers). VCT AG supplies not only high optical quality of the crystals, also guaranteed precise optical orientation. This is ensured by complex crystal qualification on a high scientific level, leading to reliable reproducibility.

Properties

- efficient laser diode pumping
- efficient low energy lamp pumping
- efficient stimulated Raman scattering (SRS)
- SRS self converter, generating 1181nm (SHG 690nm, yellow), 1320nm, 1538nm (eye-safe)
- laser output at 911nm, 1067nm and 1351nm
- absorption peak at 600nm and 811nm

Applications

- diode pumped Nd³⁺:KGW laser with slope efficiency of ~50% @1067nm ⁽¹⁾
- SRS self conversion to 1538nm (eye-safe) with 5mJ output ⁽¹⁾
- Passive Q-switching using Cr:YAG @1067nm and V:YAG @1351nm
- well known for rangefinder using flashlamp pumping or more compact design using laser diode pumping

Customs orders

- doping levels from 0.5% to 10%
- AR/HR coatings
- slabs, rods, cubes
- from prototype to OEM quantities



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¹ A.Yu.Abazadze, G.M.Zverev, et. Al; Quantum Electronics; Vol.34; 2003; page 20

² A.A.Kaminskii, et. Al; Optics Communications; Vol.183; No.1-4; 2000; page 277

³ I.V.Mochalov, Optical Engineering; Vol.36; No.6; 1997; page 1660



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Physical properties:

| | |
|--------------------------------|--|
| Yb ³⁺ concentration | 0.5-10% |
| crystal structure | monoclinic |
| thermal conductivity | $K_s=2.8\text{W/mK}$ $K_b=2.2\text{W/mK}$ |

Optical properties:

| | |
|---------------------|--------|
| Moh's hardness | 4-5 |
| melting temperature | 1075°C |

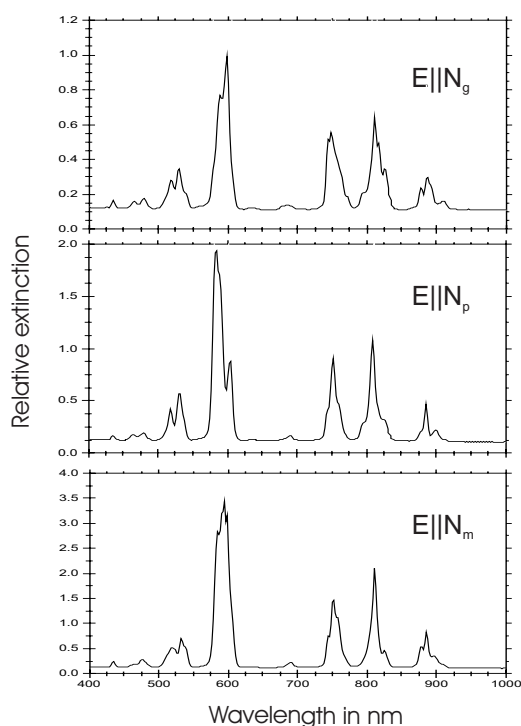
| | |
|-------------------------------|---|
| transmission range | 0.35-5.5μm |
| index of refraction (@1.06μm) | $N_p=1.978$ $N_m=2.014$ $N_g=2.049$ |

Laser properties:

| | |
|--|--|
| wavelength tuning range | 911nm, 1067nm, 1351nm |
| nonlinear refractive index n^2 | $1.6 \times 10^{-19} \text{cm}^2/\text{W}$ |
| fluorescence lifetime | 120μs |
| stimulated emission cross section $E N_p$ | $4.3 \times 10^{-19} \text{cm}^2$ |
| absorption peak | 600nm and 811nm |
| Absorption bandwidth | 12nm |

Raman converter properties of undoped KGW:

| | | |
|--------------------|-------------------------|-------------------------|
| vibrational modes | 768cm ⁻¹ | 901cm ⁻¹ |
| Raman gain @1064nm | 4.4cm/GW ⁽²⁾ | 3.3cm/GW ⁽²⁾ |
| bandwidth | 7.8nm ⁽³⁾ | 5.9nm ⁽³⁾ |



Extinction measured by PerkinElmer Lambda19
photospectrometer

For more Information and higher resolution curves, see www.vct-ag.com