EKSMA Co., Lasers, Optics, Electronics

EKSMA Co.
Mokslininku 11, 2600 Vilnius, LITHUANIA
Ph.: +370 5 2729900, fax: +370 5 2729299
sales@eksma.com
http://www.eksma.com

Barium nitrate – $Ba(NO_3)_2$

MATERIAL PHYSICAL AND OPTICAL PROPERTIES

Crystal symmetry	cubic, $P2_13$
Lattice constant	a=0.811nm
Density	3.25 g/cm^3
Hardness	2.5-3 (Mohs)
Stoke's shift	1048 cm^{-1}
SRS-amplifications increment	11 cm/GW
Optical uniformity relative parameter $\Delta n/cm$	$(3+7)\times10^{-6}$
Optical losses $\mu(\lambda)$, cm^{-1} (at λ=1.06 μm)	< 0.005
Optical quality Δn	$< 5\times10^{-6}$
Anomalous birefrigence in some areas not exceed	5nm/cm

REFRACTIVE INDICES:

λ=0.5461 μm	n=1.5756	λ=2.00 μm	n=1.5452
λ=1.064 μm	n=1.5551	λ=2.50 μm	n=1.5399

PREPARATION OF FINISHED ELEMENTS

Surface quality: 40/20 scr/dig
Flatness: λ/4 @ 633 nm
Damage threshold @ 532 nm for ns pulses: 10 J/cm^2 – in the volume, 4 J/cm^2 – at the surface Laser crystals of Maximum elements of dimensions 10×10×100 mm can be produced.

$Ba(NO_3)_2$ Stokes @ pump: 1064 nm, oscil. coef.: 1048.6 cm^{-1}	$Ba(NO_3)_2$ Stokes @ pump: 532 nm, oscil. coef.: 1048.6 cm^{-1}
1 Stoke, 1197 nm	1 Stoke, 563 nm
2 Stoke, 1369 nm	2 Stoke, 598 nm
3 Stoke, 1599 nm	3 Stoke, 638 nm
4 Stoke, 1924 nm	4 Stoke, 684 nm
1 Anti-Stoke, 957 nm	1 Anti-Stoke, 503 nm

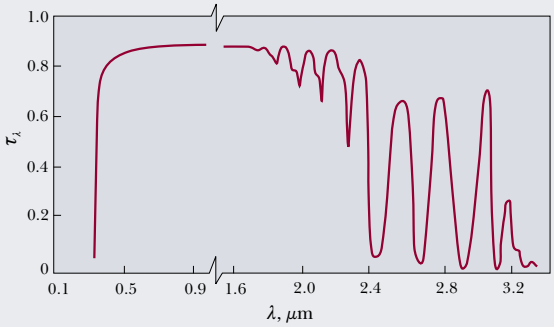
Comparing $Ba(NO_3)_2$ and KGW crystals for Raman applications $Ba(NO_3)_2$ are more effective in case of ns pulses, KGW and KYW crystals – in case of ps.

$Ba(NO_3)_2$ crystals are used as the substitution of laser radiation frequency converters based on organic dye solution. This greatly improves the devices' performance characteristics.

Also the $Ba(NO_3)_2$ crystals are used as Stimulated Raman Scattering (SRS) converters that provide non-linear conversion of frequency radiation of laser due to the stimulated Raman scttering effect. They can be used as frequency converters in tunable lasers for extention of tuning range.

$Ba(NO_3)_2$ crystals are free from bubbles and inclusions. The optical uniformity of $Ba(NO_3)_2$ crystals is comparable with the quality of barium and calcium fluoride crystals. Transmission band is from 0.35 μm up to 1.8 μm. The crystals can be used in the range from 1.8 μm up to 2.4 μm as optical filters.

Achieved radiation conversion efficiencies into first and second Stock's are ~60% and ~20 % respectively @ 532 nm pump.



Optical transmission of $Ba(NO_3)_2$ crystal

Please contact EKSMA for further information or nonstandard specifications.

Nonlinear and Laser Crystals