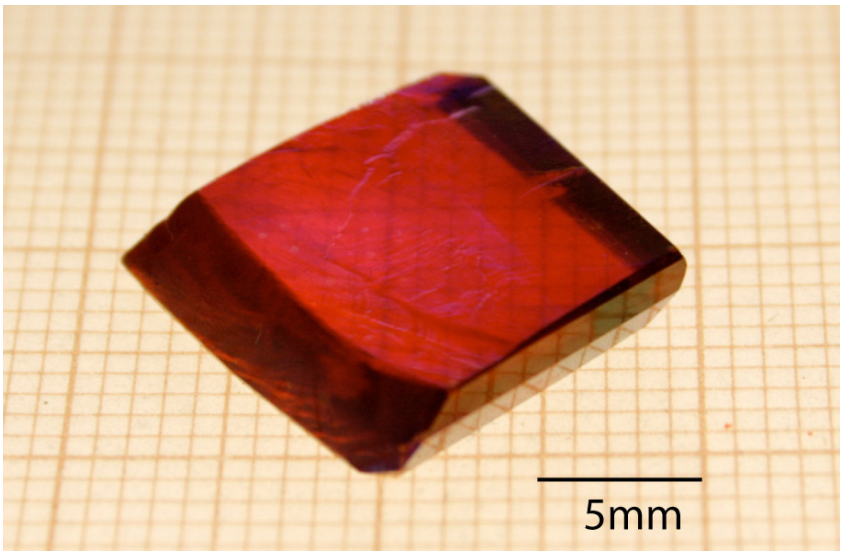
Rainbow Photonics

THz Generation

Electro-Optic OH1 Crystals

OH1: (2-(3-(4-Hydroxystyryl)-5,5-dimethylcyclohex-2-enylidene)malononitrile)



Properties

- high quality crystals
- cut and polished for various applications
- large nonlinear optical susceptibilities
- large electro-optic coefficients
- phase matching for THz-wave generation between 1200 nm and 1460 nm

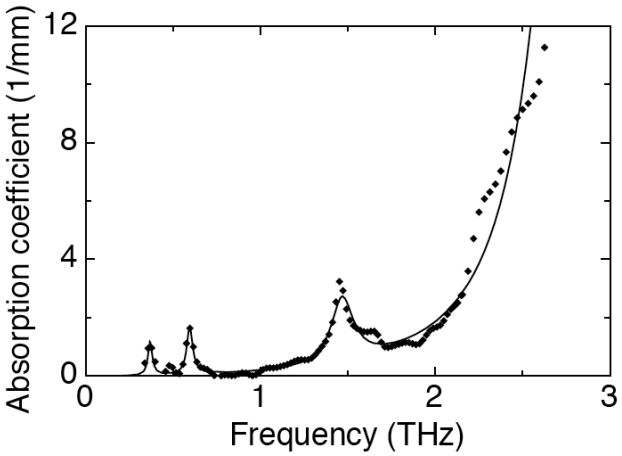
Applications

- efficient THz generation and detection from 0.1 to >10 THz
- fast electro-optic modulation
- optical parametric generation
- efficient frequency doubling of 1.55 μm radiation

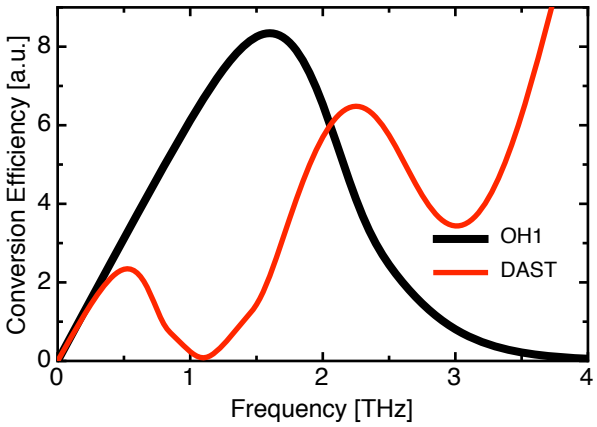
Physical Properties

melting point	212 °C		
point group symmetry	mm2		
refractive indices	n_2 = 1.58, n_3 = 2.15		
nonlinear coefficients (λ = 1.9 μm)	d_{333}	=	120 ± 10 pm/V
	d_{223}	=	13 ± 2 pm/V
	d_{322}	=	8.5 ± 2 pm/V
electro optic coefficients	r_{333} (633 nm)	=	109 ± 4 pm/V
	r_{333} (785 nm)	=	75 ± 7 pm/V
	r_{333} (1064 nm)	=	56 ± 2 pm/V
	r_{333} (1319 nm)	=	52 ± 7 pm/V

Absorption Spectrum



THz Conversion Efficiency



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2) “A hydrogen-bonded organic nonlinear optical crystal for high-efficiency terahertz generation and detection”; F. Brunner, O. Kwon, S. Kwon, M. Jazbinsek, A. Schneider, P. Günter, Opt. Express 16, 16496 (2008).
3) “Organic phenolic configurationally locked polyene single crystals for electro-optic and terahertz wave applications"; O. Kwon, S. Kwon, M. Jazbinsek, F. Brunner, J. Seo, C. Hunziker, A. Schneider, H. Yun, Y. Lee, P. Günter, Adv. Funct. Mater. 18, 3242 (2008).
4) “Scaling submillimeter single-cycle transients toward megavolts per centimeter field strength via optical rectification in the organic crystal OH1"; C. Ruchert, C. Vicario, C.P. Hauri, Opt. Lett. 37, 899 (2012).

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