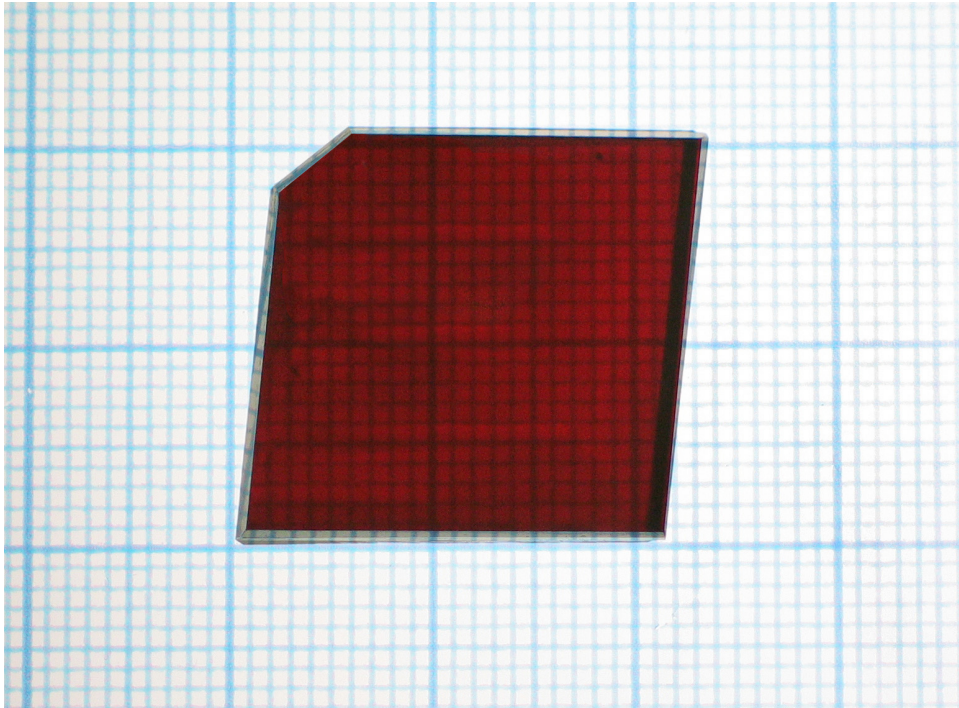


## Electro-Optic DAST Crystals

DAST: 4'-dimethylamino-N-methyl-4-stilbazolium tosylate



### Properties

- high quality crystals
- cut and polished for various applications
- large nonlinear optical susceptibilities ( $d_{11} > 1000\text{pm/V}$ )
- large electro-optic coefficients ( $r_{11}=92\text{ pm/V}$ )
- phase matching for THz-wave generation between 720 nm and 1650 nm

### Applications

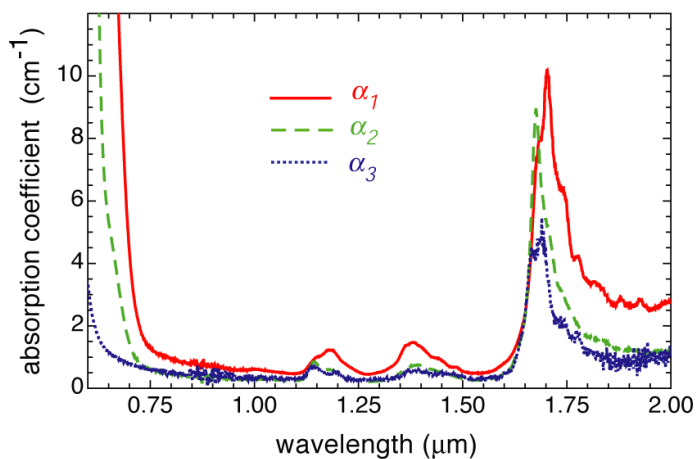
- efficient THz generation and detection from 0.3 to  $>20\text{ THz}$
- fast electro-optic modulation
- optical parametric generation
- efficient frequency doubling of  $1.55\text{ }\mu\text{m}$  radiation

## Physical Properties

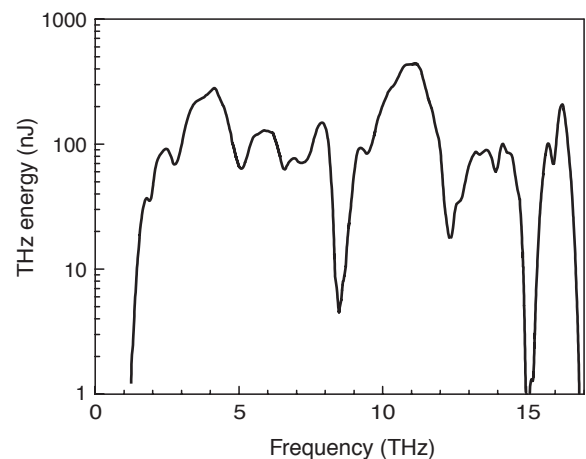
melting point	256 °C		
refractive indices	$n_1(720 \text{ nm}) = 2.519$ , $n_2(720 \text{ nm}) = 1.720$ , $n_3(720 \text{ nm}) = 1.635$		
nonlinear optical coefficients*	$d_{11}(1318 \text{ nm})$	=	1010 pm/V
	$d_{11}(1542 \text{ nm})$	=	290 pm/V, $d_{26}(1542 \text{ nm}) = 39 \text{ pm/V}$
electro optic coefficients	$r_{11}(720 \text{ nm})$	=	92 pm/V
	$r_{11}(1313 \text{ nm})$	=	53 pm/V
	$r_{11}(1535 \text{ nm})$	=	47 pm/V
dielectric constants	$\epsilon_1(3 \text{ kHz}) = 5.2$ , $\epsilon_2(3 \text{ kHz}) = 4.1$ , $\epsilon_3(3 \text{ kHz}) = 3.0$		

\*based on  $d_{11} = 0.29 \text{ pm/V}$  of  $\alpha$ -quartz

## Absorption Spectrum



## THz Generation



- 1) "Photonic applications with the organic nonlinear optical crystal DAST"; M. Jazbinsek, L. Mutter, P. Gunter, IEEE J. Sel. Top. Quantum Electron. 14,1298 (2008).
- 2) "Generation of terahertz pulses through optical rectification in organic DAST crystals: Theory and experiment"; A. Schneider, M. Neis, M. Stillhart, B. Ruiz, R. U. A. Khan, and P. Günter, J. Opt. Soc. Am. B 23, 1822 (2006).
- 3) "High Efficiency Generation and Detection of Terahertz Pulses Using Laser Pulses at Telecommunication Wavelengths"; A. Schneider, M. Stillhart and P. Günter, Opt. Express 14, 5376 (2006).
- 4) "Strong-field single-cycle THz pulses generated in an organic crystal"; C. P. Hauri, C. Ruchert, C. Vicario, F. Ardana, Appl. Phys. Lett. 99, 161116 (2011).