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Title:A new stilbazolium salt with perfectly aligned chromophores for second-order nonlinear optics: 4-N,N-Dimethylamino-4'-N'-methyl-stilbazolium 3-carboxy-4-hydroxybenzenesulfonate
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Abstract:A new organic nonlinear optical crystal 4-N,N-dimethylamino-4'-N'-methyl-stilbazolium 3-carboxy-4-hydroxybenzenesulfonate (DSCHS) has been developed with very promising properties for quadratic nonlinear optical applications. DSCHS single crystals with non-centrosymmetric structure have been obtained from aqueous methanol solution. X-ray crystallographic analysis revealed that the crystal structure of DSCHS is triclinic P1 with the chromophores aligned perfectly parallel, leading to the maximum possible order parameter <cos³&thetas;> = 1 in the crystalline state, which is optimal for electro-optics, THz-wave generation and field detection applications. Kurtz powder test has shown that DSCHS exhibits a very large second-order optical nonlinearity, with a 30 percent higher second-harmonic signal than the well-known organic nonlinear optical crystal 4-N, N-dimethylamino-4'-N'-methyl-stilbazolium tosylate (DAST).
Number of references:34
Inspec controlled terms:crystal structure - nonlinear optics - optical materials - organic compounds - X-ray crystallography
Uncontrolled terms:stilbazolium salt - perfectly aligned chromophore - second order nonlinear optics - 4-N,N-Dimethylamino-4'-N'-methyl-stilbazolium 3-carboxy-4-hydroxybenzenesulfonate - DSCHS - organic nonlinear optical crystal - quadratic nonlinear optical application - noncentrosymmetric structure - X-ray crystallographic analysis - triclinic crystal structure - electro-optical applications - terahertz wave generation - field detection applications - Kurtz powder test
Inspec classification codes:A4270J Optical polymers and other organic optical materials - A4265 Nonlinear optics - A6165 Crystal structure of specific organic compounds - A6150E Crystal

symmetry; models and space groups, and crystalline systems and classes - B4110 Optical materials - B4340 Nonlinear optics and devices
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