

科研成果名称：有机非线性材料苊唑盐(DAST)薄膜单晶的取向生长

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Controlled growth of thin single crystal of 4-N, N-dimethylamino-4-N-methyl-stilbazolium tosylate (DAST)  
有机非线性材料苊唑盐具有至今为止最大的二阶非线性光学系数、较大的电光系数和较低的介电常数;其品质因子( $n^2 r_{\text{eff}}^2 / \epsilon$ )可达  $130 \times 10^3 (\text{pm/V})^2$ , 调制带宽可达140GHz。因而DAST单晶非常有希望应用于集成光子器件、微型薄膜器件, 如薄膜单通道调制器、薄膜平面多模调制器、微型多通道波导光路以及微型光栅耦合器件。取向生长的DAST薄膜单晶对这些器件的应用尤为重要。  
Organic NLO crystal, 4-N, N-dimethylamino-4-N-methyl-stilbazolium tosylate, DAST, is a promising materials for high-performance electro-optic modulators because DAST crystals have the largest second-order nonlinear optical NLO coefficients and electro-optic coefficients and low dielectric constants. At  $\lambda = 1313 \text{nm}$ , which is an interesting wavelength for optic communication, DAST crystals provide a 140 GHz bandwidth for a 1 cm crystal, and a figure of merit ( $n^2 r_{\text{eff}}^2 / \epsilon$ ) of  $130 [ \times 10^3 (\text{pm/V})^2 ]$ . The development of thin-film devices of DAST single crystals, such as single-pass thin film electro-optic modulator, and planar waveguide and channel waveguides, is required to be suitable for integrated optics and fiber-optical communication. The major challenge is the fabrication of organic thin-film crystals with high optical quality.