

## **Analysis of the Polarization Distribution in a Polar Perhydrotriphenylene Inclusion Compound by Scanning Pyroelectric Microscopy**

**Andrea Quintel and Jürg Hulliger\***

*Department of Chemistry and Biochemistry, University of Berne, Freiestrasse 3, CH-3012 Berne, Switzerland*

**Michael Wübbenhorst**

*Department of Polymer Technology, Delft University of Technology, P.O. Box 5045, 2600 GA Delft, The Netherlands*

*Received: October 15, 1997; In Final Form: April 1, 1998*

The polarization distribution in a polar perhydrotriphenylene (PHTP) inclusion compound has been studied by scanning pyroelectric microscopy. Measurements have been performed on solution-grown crystals of PHTP-AD (AD: acceptor (A) and donor (D) disubstituted linear chromophores). The AD guest molecules form aligned dipole chains within the parallel channels created by the honeycomb-type host lattice of PHTP. Along the channel direction we found a 180° twinned macrodomain state with wedge-shaped domain boundaries adjacent to the middle of the needle-shaped crystals. In each domain the polarization is nearly constant, which implies that the majority of molecular dipoles are aligned parallel. This agrees well with predictions arising from the application of Markov's theory of stochastic processes, which explains the occurrence of polar domains due to a mechanism of dipole incorporation driven by the difference in the  $-A\cdots A-$  and  $-D\cdots D-$  intermolecular interaction energies.