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Polar Ordering and Electric Field-Induced Domain Reorientation in Channel Inclusion Compounds. J.R. Rush, M.D. Hollingsworth, M.J. Abel, Dept. of Chemistry, Kansas State Univ., Manhattan, KS 66506.

Urea inclusion compounds (UICs) consist of honeycomb-like networks of “host” ureas enclosing linear hydrocarbon “guests” or their analogues. When more than one kind of guest is present in the crystal growth medium, polar ordering of the guests can result, as demonstrated by second-harmonic generation and electric field-induced domain switching of the crystals. A striking example is presented by UICs containing mixtures of 2,10-undecanedione and 2-undecanone. This work suggests that the incorporation of tailor-made impurities into known ferroelastics is a general strategy for the preparation of new ferroelectric materials.

To understand the crystal growth processes leading to polar ordering, it is important to dissect the occupancies of guests in different sites in mixed UICs. In conjunction with birefringence mapping, X-ray diffraction of mixed UICs containing heavy-atom analogues of 2-undecanone help reveal the molecular recognition events that give rise to the polar ordering of guests.