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First Order Enantiotropic Solid State Phase Transitions—From Simon through Ubbelohde to Mnyukh. Frank H. Herbstein, Dept. of Chemistry, Technion-Israel Institute of Technology, Haifa. Israel 32000.

Mnyukh's studies of enantiotropic phase transitions in eight organic crystals showed that all proceed by a nucleation-and-growth mechanism. Nucleation is localized at defects in the parent phase; growth can be either epitaxial and oriented if parent and daughter phases have closely similar structures, or randomly orientated if there are substantial structural differences (Y. Mnyukh "Fundamentals of Solid State Phase Transformations, Ferromagnetism and Ferroelectricity" 1st Books, 2001). This description also fits the so-called lambda transition in NH_4Cl at 242 K, whose investigation in 1922 by F. Simon first gave rise to doubts (expressed most clearly by A. R. Ubbelohde some fifty years ago) about the applicability of classical thermodynamics to some phase transitions (*Brit. J. Appl. Phys.* **7**, 313 (1956)). The neutron diffraction study of the neutral to ionic transition in TTF-chloranil (University of Rennes (I) group), and the phase transition in 2-(2,4-dinitrobenzyl)-3-methyl-pyridine at 318 K, studied by NMR (Schmidt *et al.* (*JACS*, 121,11291,1999), fit nicely to the Mnyukh description. However, the work of Mitkevich et al. (*Acta Cryst*, B**55**, 799 (1999)) on the transition at ≈185 K in 4,4'-dichlorobenzophenone hints that the Ubbelohde approach may still have a role to play.