

Crystallization Kinetics Study on Orthogonal Ordering in *N*-(*p*-*n*-Alkoxybenzylidene)-*p*-*n*-Alkylanilines (*nO.m* Compounds) by Thermal and Electrical Techniques. Part I

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A systematic kinetic study of crystallization among two smectogens of higher homologues of the benzylidene aniline series *nO.m*, viz. 4O.12 and 8O.12, has been carried out by thermal microscopy, differential scanning calorimetry (DSC), and dielectric studies. The crystallization kinetics was studied by two techniques, viz. the traditional thermal analysis, i. e. DSC, and electrical studies, i. e. capacitance and dielectric loss variation measurements with temperature. The DSC thermograms were run from the crystallization temperature to the isotropic melting temperature for different time intervals. The liquid crystalline behaviour together with the rate of crystallization of smectic ordering in newly synthesized *nO.m* compounds were discussed in relation to the kinetophase (which occurs prior to crystallization). The molecular mechanism and dimensionality of crystal growth were computed using the Avrami equation. The characteristic crystallization time (t^*) at each crystallization temperature was deduced from the individual plots of $\log t$ and ΔH . Further, it was observed that the data obtained from DSC and dielectric studies were in good agreement.

Key words: Crystallization Kinetics; Thermal Microscopy; Differential Scanning Calorimetry; Smectic Phases; Dielectric Studies; Kinetophase.