

Broad Band Relaxation Studies of a Substance with the Nematic, Smectic A, and Smectic B Polymorphism

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Results of dielectric studies of *p*-hexyloxybenzylidene-*p'*-fluoroaniline (FAB-OC6) are presented. The temperature range covered all phases: isotropic, nematic, smectic A and smectic B. The complex dielectric permittivity, $\varepsilon^*(\omega) = \varepsilon'(\omega) - i\varepsilon''(\omega)$, was measured with the aid of two experimental set-ups: an impedance analyser (1 kHz - 20 MHz) and a time domain spectrometer (20 MHz - 4 GHz). This allowed two main relaxation processes in all phases studied to be separated: the low frequency, l. f., process connected with molecular reorientations around the short axes, and the high frequency, h. f., process connected with the rotations around the long axes. The corresponding relaxation times and activation enthalpies were obtained. The l. f. relaxation time changes step-wise at the phase transition points, whereas the h. f. one passes smoothly through all phases. The results of the studies are confronted with those obtained in recent NMR studies of the substance.

Key words: Liquid Crystals; Nematic; Smetics; Dielectric Relaxation; NMR.