

# Study of High Frequency Relaxation Processes in Three Substances with the –CN Groups at the Lateral Positions

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Three liquid crystalline (LC) substances with the cyano-groups attached at the lateral positions to the molecular cores were studied with the aid of dielectric spectroscopy methods. The high frequency relaxation process connected with the molecular reorientations around the long molecular axes was studied in the isotropic, nematic and several smectic phases. The dielectric spectra are rather complex, indicating a contribution from several molecular processes to the main relaxation process. The dielectric time changes smoothly at the phase transitions between “liquid-like” phases (isotropic – nematic – smectic A – smectic C), and becomes shorter at the transition to the “solid-like” smectic G phase with a lowering of the activation barrier. This indicates that the molecules perform broad angle librational motions rather than overall rotational motions in this phase. In case of a substance having two cyano groups attached to the benzene ring, a pronounced jump-wise change of the relaxation time was observed at the isotropic – smectic A transition.