

Deuteron NMR Lineshapes in the Antiferroelectric Liquid Crystalline Phase of MHPOBC

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The deuteron NMR lineshapes in the tilted antiferroelectric smectic liquid crystalline phases are evaluated for: i) the case of a discrete short pitch modulation $R = N \cdot d$ where $N = 2, 3, 4$, ii) for a superposition of two modulations p_1 and p_0 where $p_0 \gg p_1$ as well as iii) for the case where in addition rapid molecular exchange between adjacent layers takes place due to translational diffusion. The results are compared with the experimental deuteron NMR spectra of α -CD₂ deuterated MHPOBC in the Sm C_A^{*} phase measured at different angles between the magnetic field direction and the normals to the smectic layers. The alternating tilt structure of the Sm C_A^{*} phase is confirmed.

Key words: Liquid Crystals; NMR; Diffusion.