

Location and Average Alignment of Alkylpyridinium Ions in Cationic Nematic Lyomesophases

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Deuterium quadrupole splittings from the aromatic ring of a series of deuterium labeled n-alkylpyridinium ions with linear n-alkyl groups from C₁ to C₁₀ have been measured using ²H-NMR spectroscopy. These splittings were used to calculate the two order parameters describing the average alignment of the individual pyridinium rings, and these values were used to determine the location and preferred orientation of the ions when contained in either of the lyotropic liquid crystals of this study. Two cationic mesophases, prepared from either hexadecylpyridinium chloride or tetradecyltrimethylammonium bromide, were used as the host systems. The smaller alkylpyridinium ions (C₁-C₅) were found predominantly in the interstitial water. The intermediate size ions (C₆-C₁₀), which were distributed more effectively into the micelle, have a disruptive effect in the mesophase, probably a result of modifications in the degree of alignment of the micelle, possibly because of modifications of its inter