

Two-dimensional Exchange ^{35}Cl NQR Spectroscopy of Chloral Hydrate

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Two-dimensional exchange ^{35}Cl NQR spectroscopy has been applied for studies of the CCl_3 -group reorientation processes in chloral hydrate. The experimental results are interpreted on the basis of the 2D-exchange NQR theory, which takes into account the off-resonance irradiation. The pulse-optimisation procedure, which is required by this theory, enabled the detection of the 2D-exchange NQR spectrum and was applied to the quantitative study of the exchange processes in chloral hydrate. A temperature dependent study of the exchange rate revealed two different activation processes in the temperature ranges from 240 to 295 K and from 295 to 310 K, respectively.

Key words: Nuclear Quadrupole Resonance; 2D Spectroscopy; Electric Field Gradient Tensor; Exchange.