NMR studies of solid-state dynamics.

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Streszczenie

NMR relaxometry has gained popularity in recent years, due to advances in experimental methodology and theory. We present an overview of applications of NMR relaxometry (with special focus on Field Cycling studies) to solid state, including a variety of systems ranging from simple crystals to proteins. Mechanisms and principles of the relaxation effects observed for solid state are explained. This presentation is accompanied by an outline of theoretical achievements with special attention drawn to relaxation processes in the presence of anisotropic interactions and slow dynamics. The overview is complemented by discussing the potential of NQR spectroscopy for studying dynamic processes in solids. Again, experimental examples are combined with an account of the underlying theory. Relations between NMR relaxometry, spectroscopy and diffusometry results are discussed. Different motional models, including rotational, translational and vibrational dynamics in solid state, are presented and the possibility of unambiguously determining the mechanism of motion is critically considered.

Słowa kluczowe

NMR, NQR, Relaxation, Dynamic, Solid state, Diffusion, Correlation, Field cycling, Spectroscopy, Polarization transfer

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