Disorder, Defects and Dynamics in Functional Materials by NMR

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Solid-state nuclear magnetic resonance is an efficient tool to elucidate structure and dynamics of disordered compounds. A simple powerful approach for structural characterization is to study samples synthesized under various conditions by quantitative NMR experiments. In combination with quantum chemical calculations it is possible to identify substitutional defects from their NMR fingerprint [5,6]. Their distribution throughout a host can be studied with multipulse NMR [6] or in case of light-converting phosphors through the *NMR visibility* of the nuclei of the host [1-3]. On the example of inorganic phosphors [1-3], transparent conductive oxides [5,6], anodic aluminium oxide [4] and ionic conductors it is shown, how the NMR toolbox can help to understand the short range order in functional materials.

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