

HYBRID PEROVSKITE: SOLID-STATE NMR INVESTIGATION FROM ROOM TO VERY LOW TEMPERATURES

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Presenting high solar energy conversion efficiencies^{1,2} (21%), Hybrid Perovskite APbX₃ (A is a small organic cation, X=Cl, Br, I) have recently become one of the most promising compound in the field of photovoltaic devices.

In a first step, we will present a room temperature NMR study of three methylammonium lead halides, namely MAPbX₃ (MA=CH₃NH₃). Investigation of the organic part confirms the isotropic mobility of the methylammonium cations while the structure of the inorganic part is confirmed by ²⁰⁷Pb NMR. Several years ago, R.E. Wasylishen *et al.*³ had already revealed the interest of deuterium NMR to investigate the temperature behaviour and the dynamics operating in such materials in their isotropic phase. Thus, in a second step we will focus on CH₃ND₃PbBr₃ in the anisotropic dynamic regime. By using a homemade probehead, we can discuss on the dynamical behaviour of the inorganic part of such hybrid perovskites, which can be further rationalized based on appropriate theoretical approaches⁴.

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This project has received funding from the European Union's Horizon 2020 research and innovation Program under the grant agreement No 687008 (GOTSolar).