

Abstract Submitted
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NMR Studies of Sn clathrates XIANG ZHENG, SERGIO RODRIGUEZ, JOSEPH H. ROSS, JR, Department of Physics, Texas A&M University — Clathrates are materials with an open cage structure. Because of the low thermal conductivities these materials may be good choices for thermoelectric applications and energy saving devices. Thus they have become important materials for current study. We report ^{71}Ga NMR experiments on $\text{Ba}_8\text{Ga}_{16}\text{Sn}_{30}$ clathrates, which have particularly low thermal conductivities We will compare different properties of the two types of $\text{Ba}_8\text{Ga}_{16}\text{Sn}_{30}$ clathrates, type-I and type-VIII, which are different in structure. The NMR lineshapes and relaxation times were measured in temperatures between 295K and 4.2K. For a type-I sample, we observe several different peaks with an unexpectedly large range of Knight shift. Also we observe large changes for the relaxation times at low temperature which are not consistent with the Korringa law, the normal behavior for NMR due to conduction electrons. These results are different from what we observe in other clathrates. Thus we tentatively assign these results to rattling type atomic motion, and will compare the data to models for relaxation due to such motion. This research is supported by the Robert A. Welch Foundation.

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