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Slow H hopping motions in MgH_2 and alanates M.S. CONRADI, ERIK CARL, T.M. IVANCIC, Washington U., Physics, R.C. BOWMAN, JR., JPL — Unlike the interstitial (metallic) metal-hydrides, ionic and/or complex hydrides such as MgH_2 and $NaAlH_4$ have very slow rates of H atomic hopping. Because the rates are too small ($<10^5$ s^{-1}) for motional narrowing of the dipolar-broadened H NMR lines, we report here the rates of motion from T_{1D} slow-motion measurements. The activation energy for H motion in MgH_2 has been determined to be 1.45 eV. In undoped $NaAlH_4$, the rate of motion is also thermally activated. In $ScCl_3$-doped $NaAlH_4$, much faster motion (shorter T_{1D}) is found, even at low-temperature. At low-T, the role of rotating AlH_6 groups formed by partial dehydriding is suspected.

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