**NMR Studies of Hydrogen Diffusion in LaNi_{5.0}H_{6.0} and LaNi_{4.8}Sn_{0.2}H_{6.8}**

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Diffusion measurements of hydrogen in LaNi_{5.0}H_{6.0} and LaNi_{4.8}Sn_{0.2}H_{6.8} were made between 260 K and 360 K using the APFG-NMR technique. The diffusivity of hydrogen in LaNi_{4.8}Sn_{0.2}H_{6.8} is characterized by a higher mobility and a lower activation enthalpy (H_a) than observed in LaNi_{5.0}H_{6.0}. The diffusivities at room temperature, D(300 K), are 9.2 x 10^{-12} m^2 s^{-1} and 3.8 x 10^{-12} m^2 s^{-1} for LaNi_{4.8}Sn_{0.2}H_{6.8} and LaNi_{5.0}H_{6.0}, respectively. Arrhenius fits to the diffusivities yielded activation enthalpies of H_a = 0.32 eV for LaNi_{5.0}H_{6.0} and H_a = 0.22 eV for LaNi_{4.8}Sn_{0.2}H_{6.8}. Proton spin-lattice relaxation rates were also measured on the same samples in the temperature range between 100 K and 350 K. The D values and proton relaxation data are shown to be consistent with a diffusion mechanism involving at least two stages of hydrogen motion.

Work partially supported by D.O.E. Grant DE-FG03-94ER14493. Caltech operates JPL under contract with NASA. Travel support provided by NATO Grant 910179.