

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Optimizing Hydrogen Storage by Doping the LiBH₄+MgH₂ Reaction with Various Niobium Based Oxides PAUL HORNUNG, ROBERT WALKO, ANDREW WENZEL, RICHARD WRIGHT, TABBETHA DOBBINS, Rowan University, Dept. of Physics Astronomy — In this study, the effects of doping the dehydrogenation reaction of MgH₂ + 2LiBH₄ was combined with 5 mole% of three different Niobium based oxides (Nb₂O₅, NbO₂, and LiNbO₃). The compounds were mixed using high energy ball milling, and then heated using an air tight heating stage. We looked for changes in the Raman spectra as temperature increased (up to 350C) as an indication of hydrogen desorption reaction. We found that milled LiBH₄ undergoes significant changes in Raman spectra during heating to 130C. MgH₂ undergoes significant changes when comparing before and after milling—but in each case, the spectral peaks remain unchanged during heating to 350C. The sample with LiNbO₃ exhibited a concrete change in Raman spectrum at 300 C while the sample doped with Nb₂O₅ underwent a change in spectra at 170C. The sample doped with NbO₂ showed little change in spectra when the samples were heated up to 350C. Further studies are underway to examine the nature of the changes in the Raman spectra using X-ray diffraction and residual gas analysis.

Tabbetha Dobbins
Rowan University, Dept. of Physics
Astronomy

Date submitted: 06 Nov 2015

Electronic form version 1.4