

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Sorting Category: 16.12.6 (E)

New Quaternary Hydride $\text{Li}_3\text{BN}_2\text{H}_8$ with >10 wt% Hydrogen: II. Hydrogen Desorption Measurements FREDERICK E. PINKERTON, GREGORY P. MEISNER, MARTIN S. MEYER, MICHAEL P. BALOGH, General Motors Research and Development Center, MATTHEW KUNDRAT, Aerotek Corp. — We report thermogravimetric, volumetric, and calorimetric measurements of hydrogen desorption from the new quaternary hydride $\text{Li}_3\text{BN}_2\text{H}_8$ (11.9 wt% theoretical hydrogen capacity). $\text{Li}_3\text{BN}_2\text{H}_8$ releases ≥ 10 wt% hydrogen at temperatures above $\sim 250^\circ\text{C}$. Simultaneous mass spectrometry residual gas analysis shows that a small amount of ammonia (2-3 mole% of the generated gas) is released concurrently. Independent volumetric and gravimetric measurements are in excellent agreement regarding the quantities of hydrogen and ammonia released. Differential scanning calorimetry and in-situ x-ray diffraction show that $\text{Li}_3\text{BN}_2\text{H}_8$ melts at $\sim 190^\circ\text{C}$, thus hydrogen evolution occurs from the molten state. It dehydrides to the solid product Li_3BN_2 , and the evolved gas satisfactorily accounts for all of the available hydrogen content. Preliminary calorimetric measurements suggest that hydrogen release is exothermic, and, hence, not easily reversible; to date, rehydriding has not been achieved.

Prefer Oral Session
 Prefer Poster Session

Frederick Pinkerton
frederick.e.pinkerton@gm.com
General Motors Research and Development Center

Date submitted: 30 Nov 2004

Electronic form version 1.4