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New Quaternary Hydride $Li_3BN_2H_8$ 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 $Li_3BN_2H_8$ (11.9 wt% theoretical hydrogen capacity). $Li_3BN_2H_8$ releases $\geq$10 wt% hydrogen at temperatures above $\sim$250°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 calorimetery and in-situ x-ray diffraction show that $Li_3BN_2H_8$ melts at $\sim$190°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.

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