Supporting Information

Hydrogen Storage Properties of the $3Mg(NH_2)_2$–$2Li_3AlH_6$ System

Jun Yang,* Dongan Liu[+], Andrea Sudik, Chris Wolverton,[§]Patrick Ferro[$]

+ Department of Mechanical Engineering, University of Michigan, 1023 H. H. Dow Building, 2350 Hayward Street, Ann Arbor, MI 48109,USA
§Department of Materials Science and Engineering, Northwestern University, 2220 Campus Drive, Evanston, IL 60208, USA
$Department of Mechanical Engineering, Gonzaga University, 502 East Boone Avenue, Spokane, WA 99258, USA

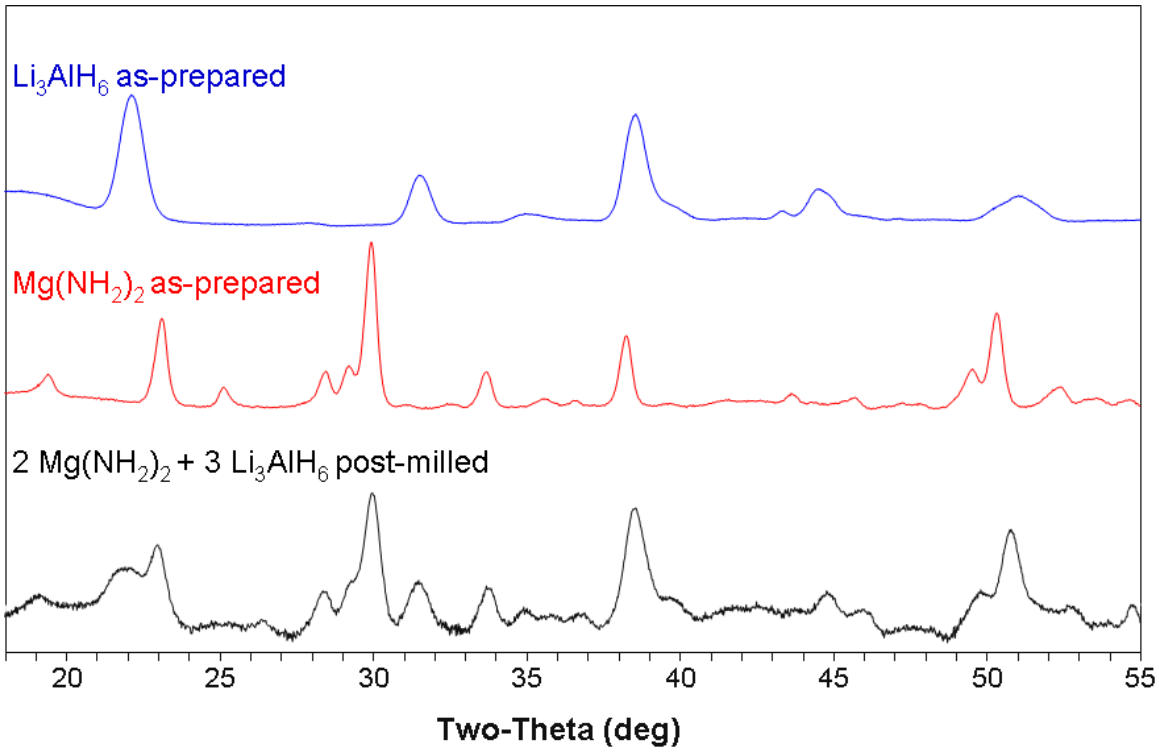

Figure S1. Room temperature PXRD patterns for post-milled $3Mg(NH_2)_2$–$2Li_3AlH_6$ (black) as compared to PXRD patterns for as-prepared $Mg(NH_2)_2$ (red) and Li_3AlH_6 (blue).

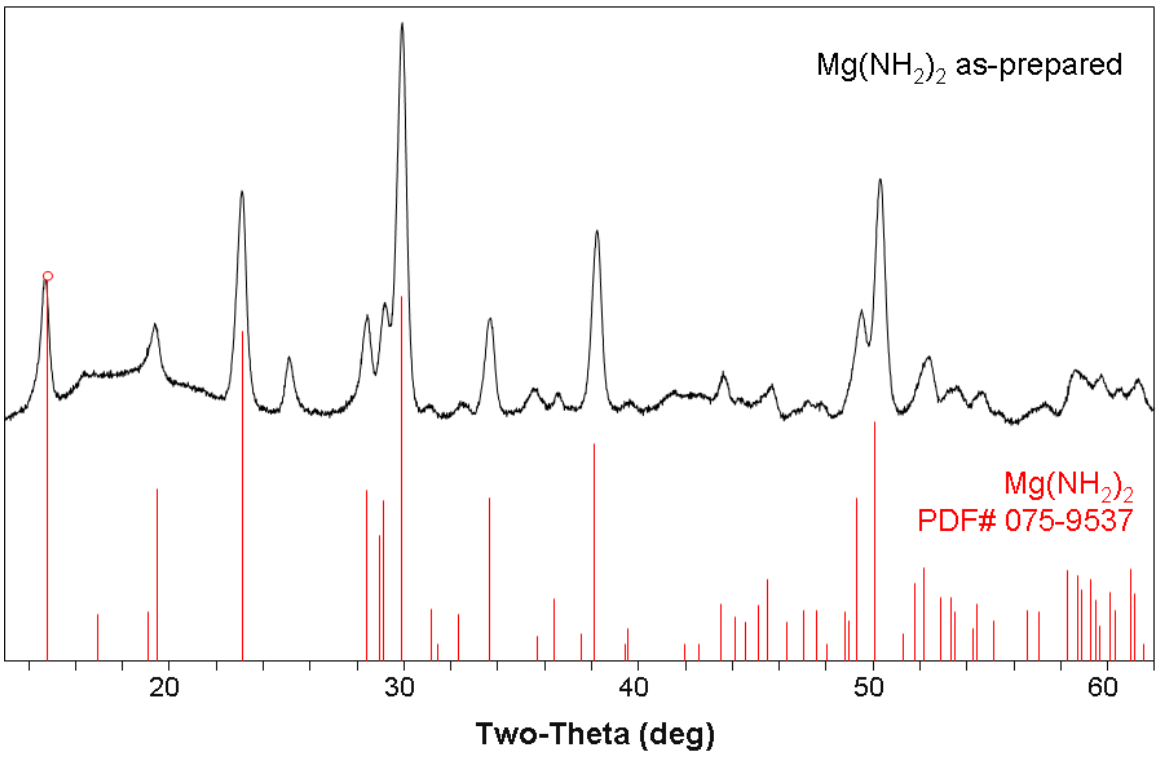

Figure S2. Room temperature PXRD patterns for as-prepared $Mg(NH_2)_2$ (black). Phase assignment is made based on comparisons with PDF data for $Mg(NH_2)_2$ (#075-9537).

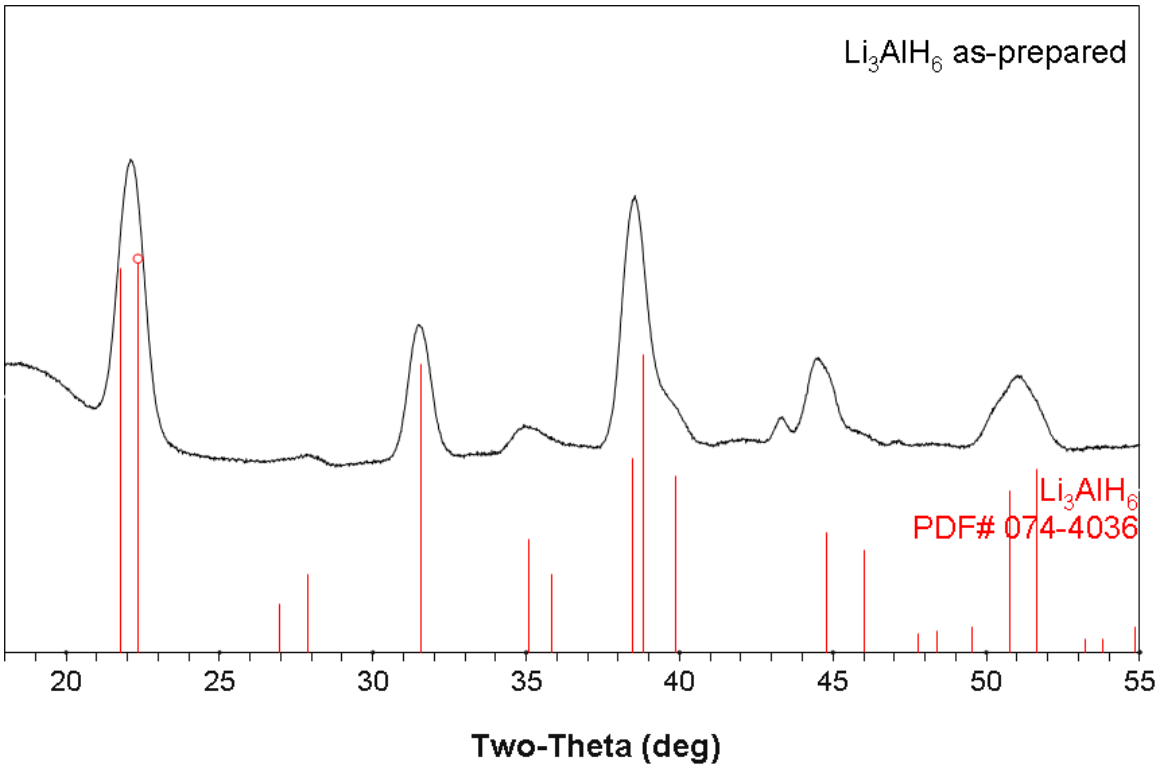

Figure S3. Room temperature PXRD patterns for as-prepared Li_3AlH_6 (black). Phase assignment is made based on comparisons with PDF data for Li_3AlH_6 (#074-4036).

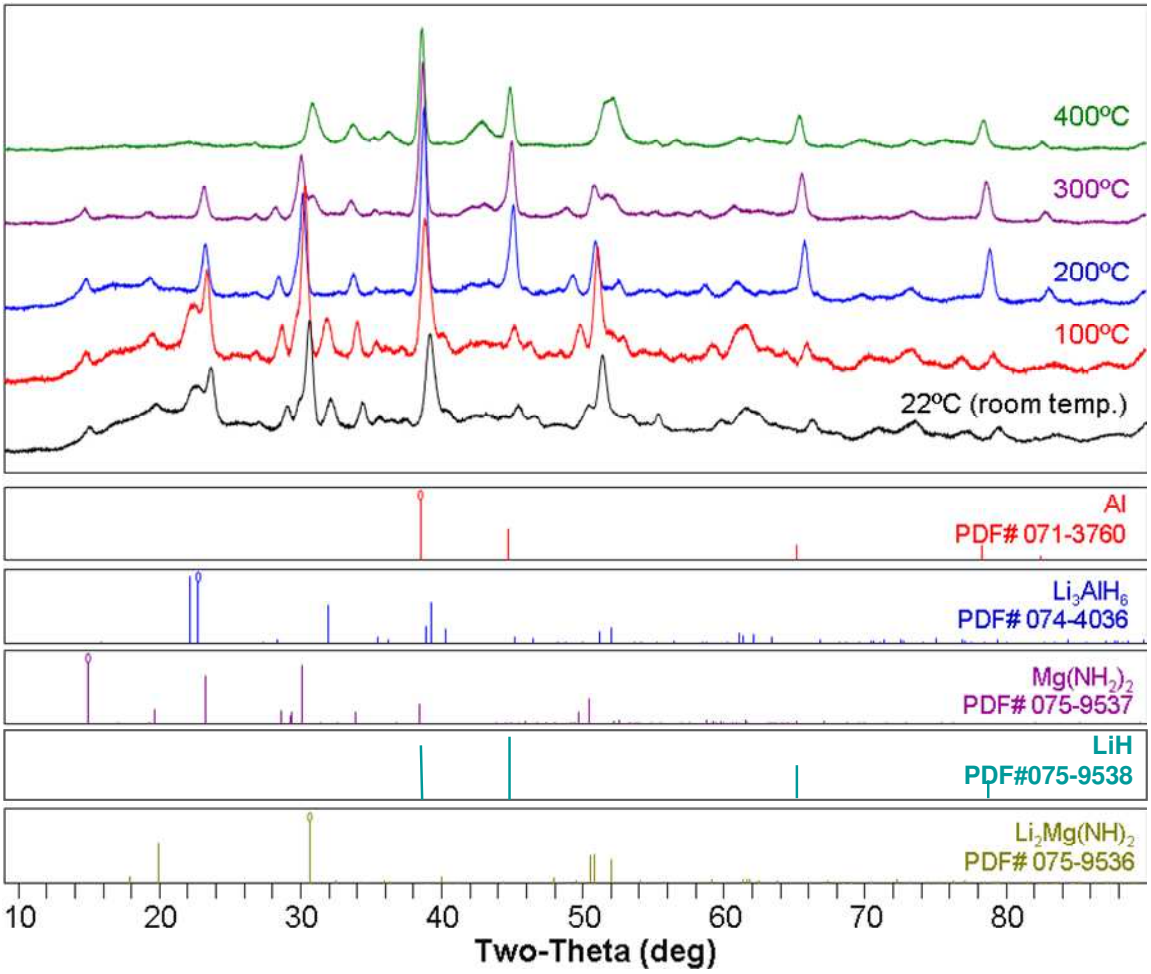

Figure S4. Select in-situ PXRD data for $3Mg(NH_2)_2$–$2Li_3AlH_6$ as a function of temperature at 22ºC (black), 100ºC (red), 200ºC (blue), 300ºC (purple), and 400ºC (green). Phase assignments were made based on comparisons with PDF data for Al (#071-3760, red), Li_3AlH_6 (#074-4036, blue), $Mg(NH_2)_2$ (#075-9537, purple), LiH (#075-9538, light blue) and $Li_2Mg(NH)_2$ (#075-9536, green).

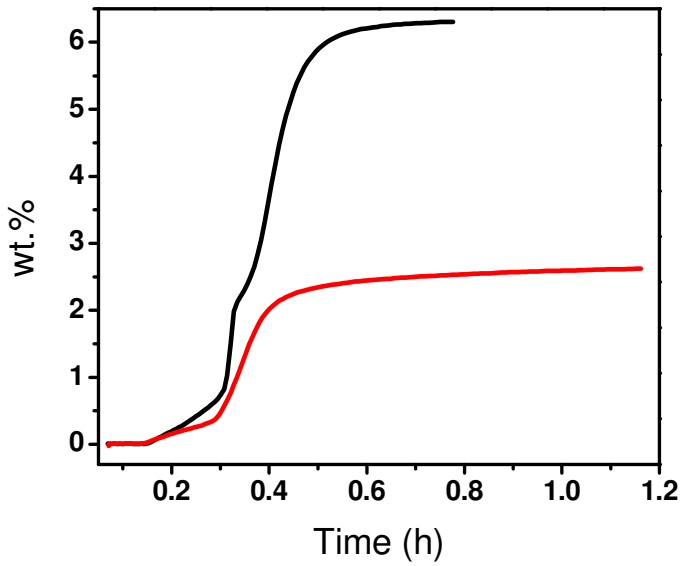

Figure S5. Hydrogen desorption kinetics at 300ºC to 1 bar H_2 back-pressure for $3Mg(NH_2)_2$–$2Li_3AlH_6$ mixed at low-energy for the first (black) and second (red) desorption cycles after recharging at 230ºC and 180 bar H_2 for 10 hours.