The effect of $Sr(OH)_2$ on the hydrogen storage properties of the $Mg(NH_2)_2$-2LiH system

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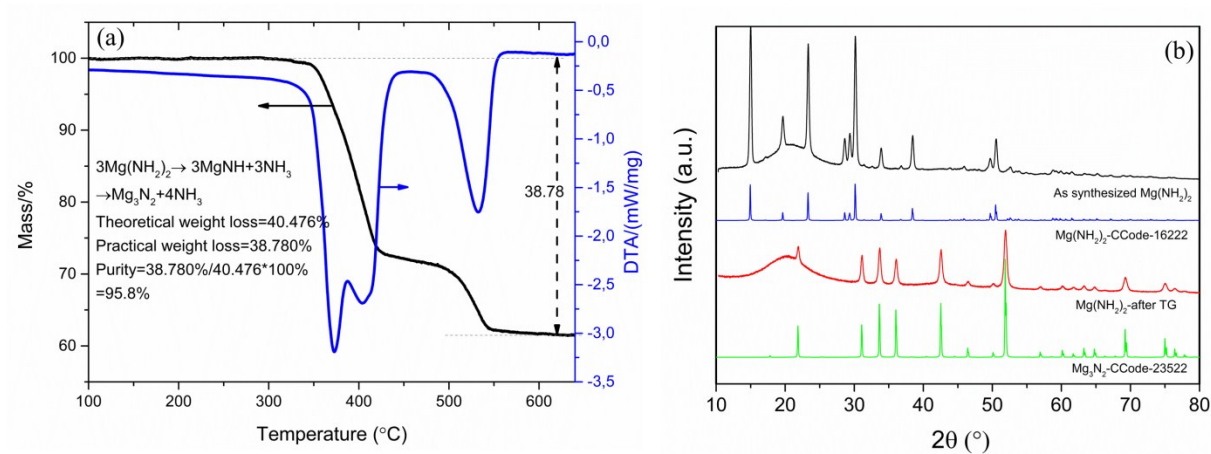
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Figure S1. (a) TG-DTA curves of the as prepared $Mg(NH_2)_2$, heated from 30 to 650 °C with a heating rate of 10 °C/min, under 50 ml/min Argon flow. (b) PXD of the as synthesized $Mg(NH_2)_2$ and after TG (Mg_3N_2). Based on the TG-DTA and PXD results, the purity of $Mg(NH_2)_2$ is ca. 95.8%. PXD tests were carried out with a Bruker D8 discover X-ray diffractometer, using Cu radiation (λ=0.154184 nm, 50 kV, 1000 µA), with a scanning rate of 0.05 °/s. Air tight sample holders were used (Bruker, Germany) to prevent contamination of the sample.
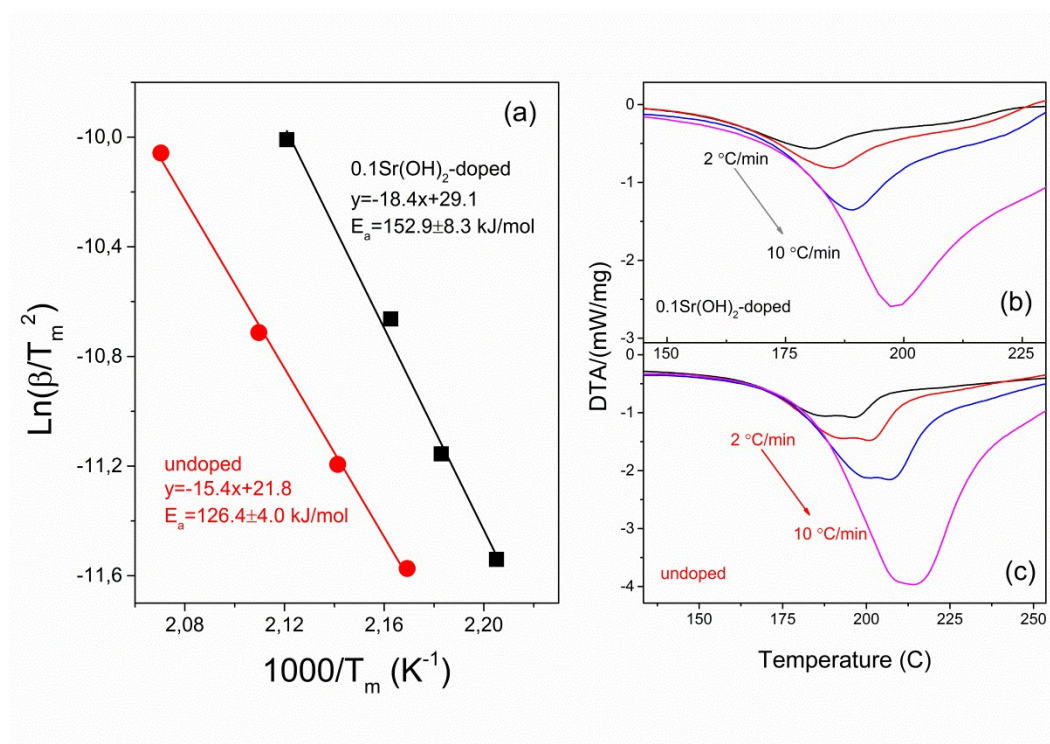
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Figure S2. Kissinger plots (a) of the undoped and $0.1Sr(OH)_2$-doped samples; and DTA curves of the $0.Sr(OH)_2$-doped (b) and the undoped (c) samples with a heating rate of 2, 3, 5 and 10 °C/min, respectively. It should be pointed out that the Ea of the undoped sample was calculated based on the first reaction peak.
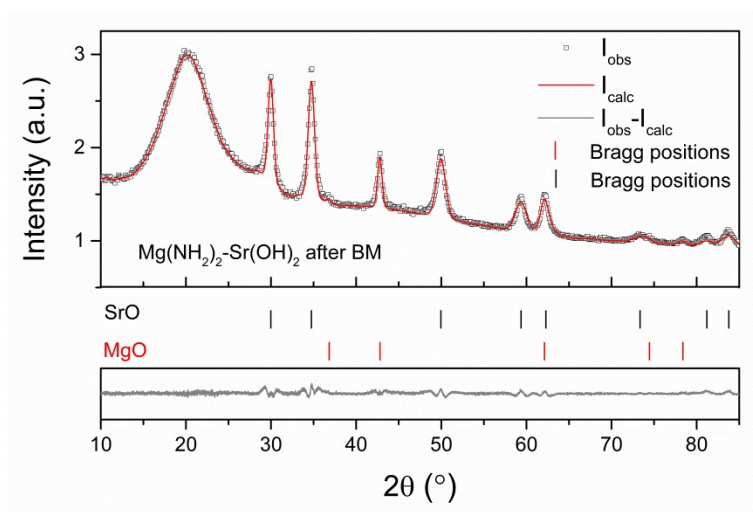
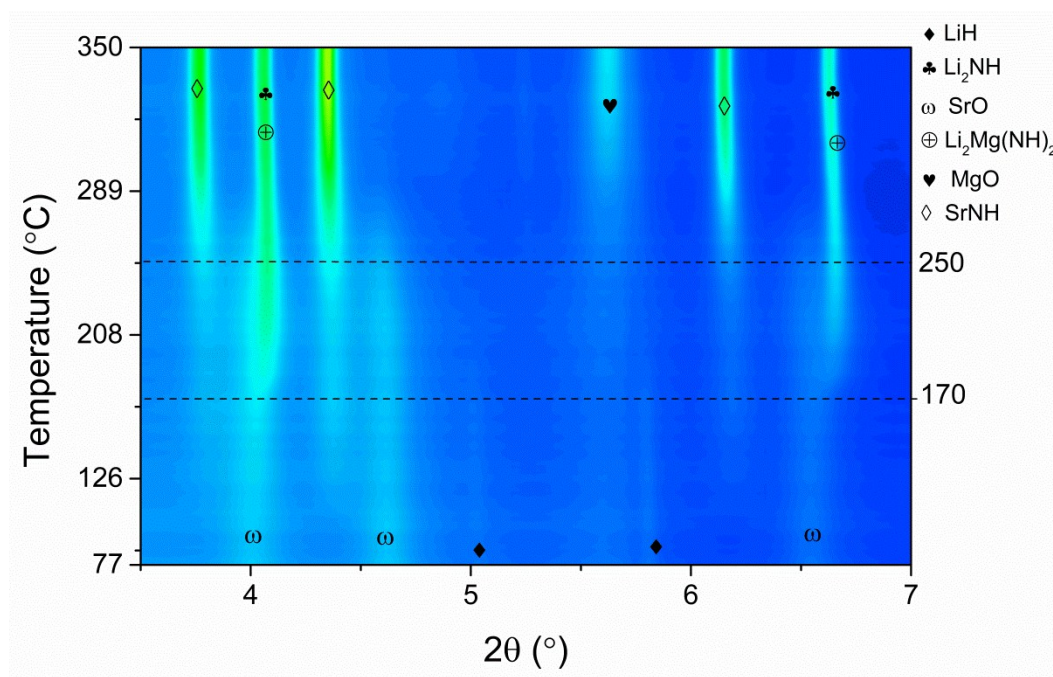Figure S3. PXD pattern of the ball milled $Mg(NH_2)_2$-$Sr(OH)_2$ mixture.

Figure S4.Dehydrogenationcontour plot of the 0.2 Sr(OH)$_2$-doped sample in the 2θ range between 3.5 and 7 (°) (heating rate of 10 °C /min, λ=0.20745Å).
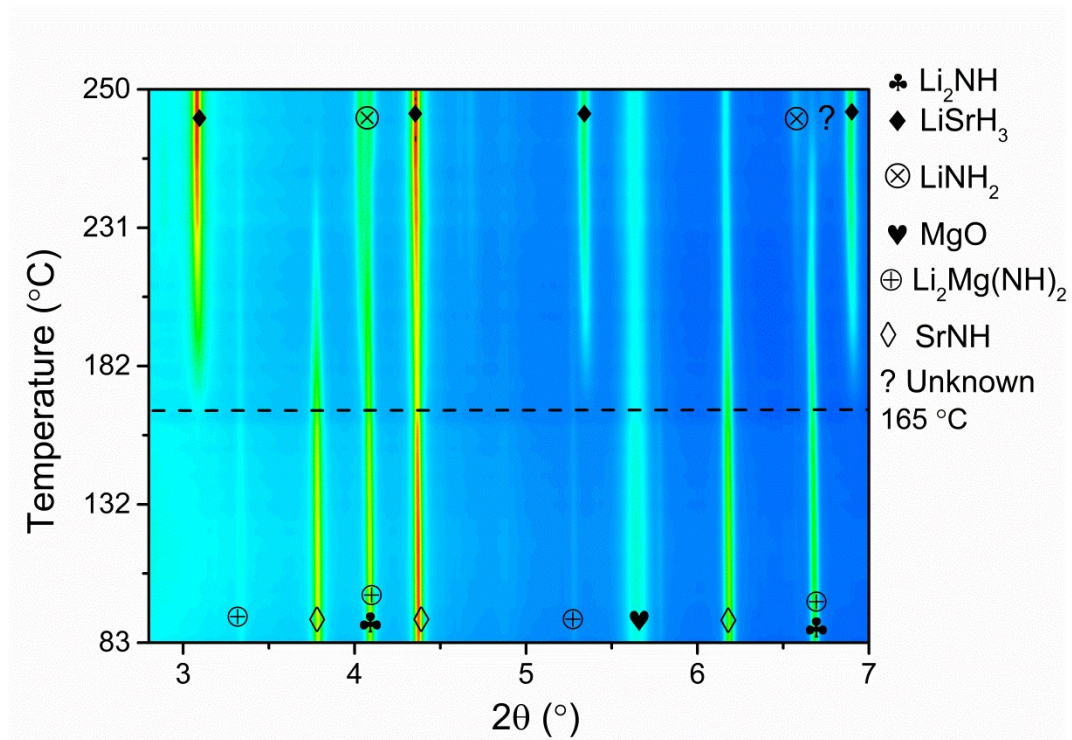
Figure S5. Contour plot of re-hydrogenation curves of 0.2Sr(OH)$_2$-doped sample in the 2θ range between 2.8 and 7 (°) (heating rate of 10 °C /min, λ=0.20745Å).
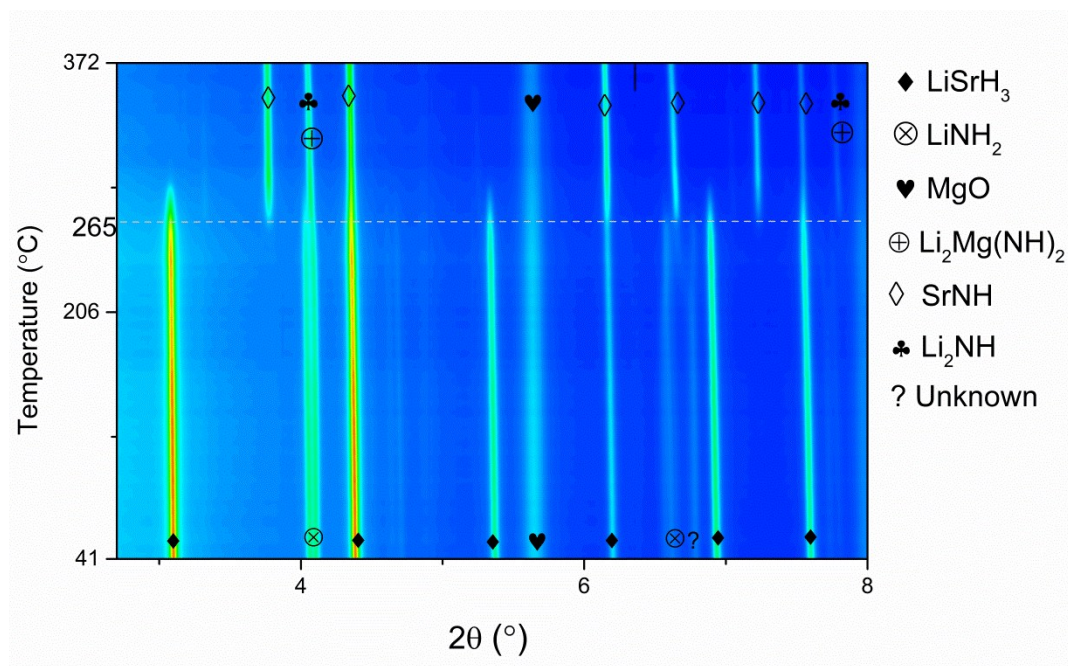
Figure S6. Contour plot of the second dehydrogenation of 0.2Sr(OH)$_2$-doped sample in the 2θ range between 2.8 and 8 (°) (heating rate of 10 °C /min, λ=0.20745Å).