**Supporting Information**

**Fig. S1** XRD patterns of the as-synthesized TiN-doped NaAlH₄ at different milling times.

**Fig. S2** FTIR spectra of as-synthesized TiN-doped NaAlH₄ and commercial NaAlH₄.
**Fig. S3** JMA plots for the first-step isothermal dehydrogenation.

**Fig. S4** The dehydrogenated TiN-doped NaAlH$_4$ sample at different stages.