

Electronic Supplementary Information for

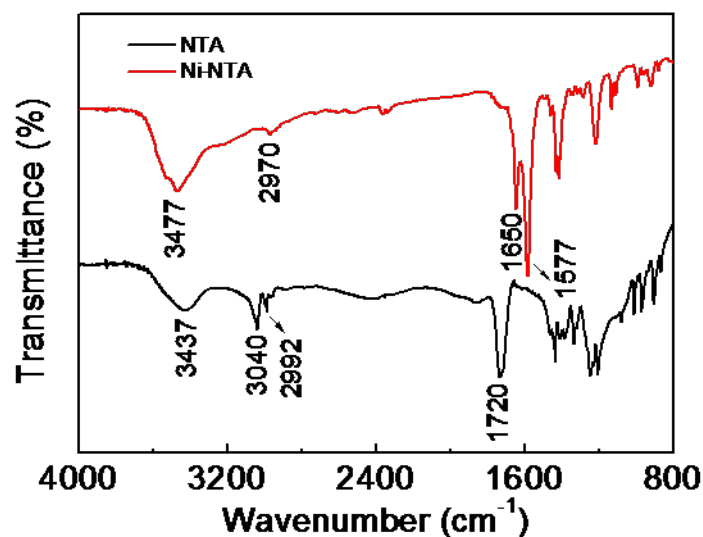
**In-situ synthesized one-dimensional porous Ni@C nanorods as catalysts for hydrogen storage properties of MgH<sub>2</sub>**

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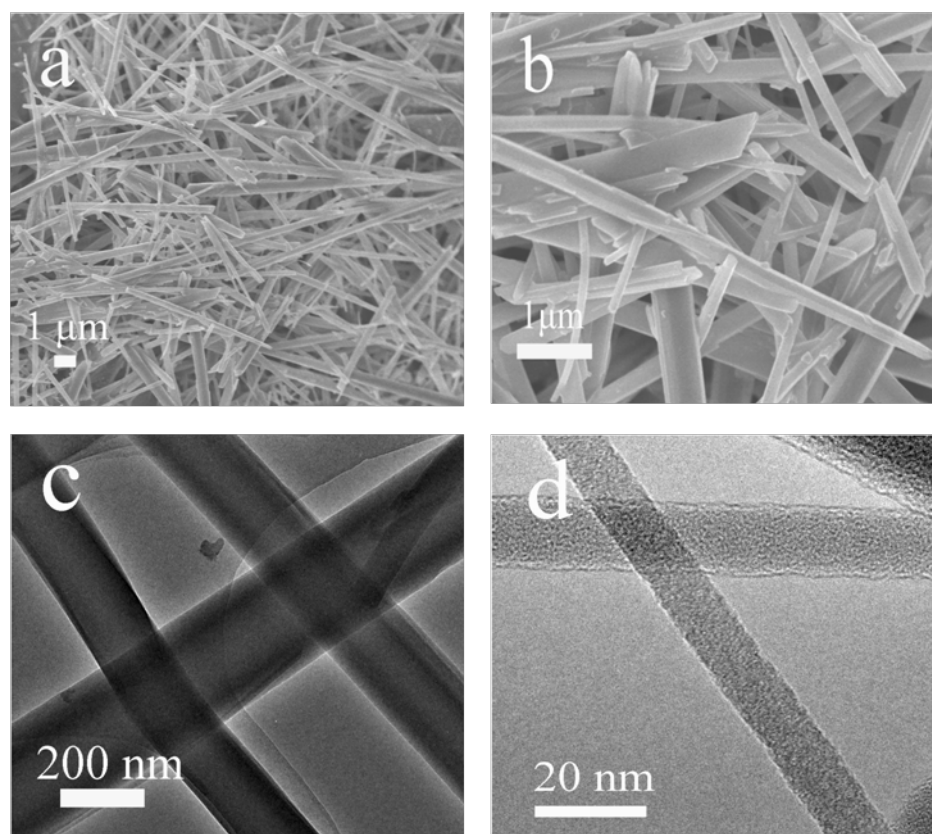
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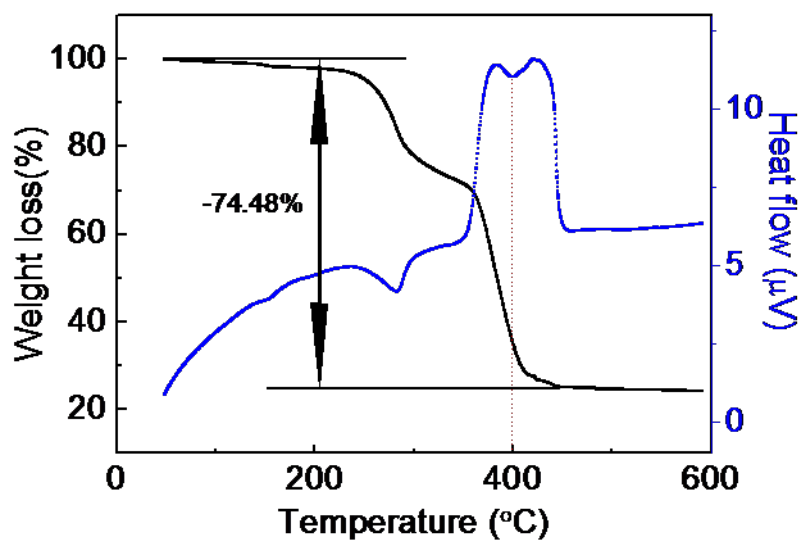
**Supplementary Figures**



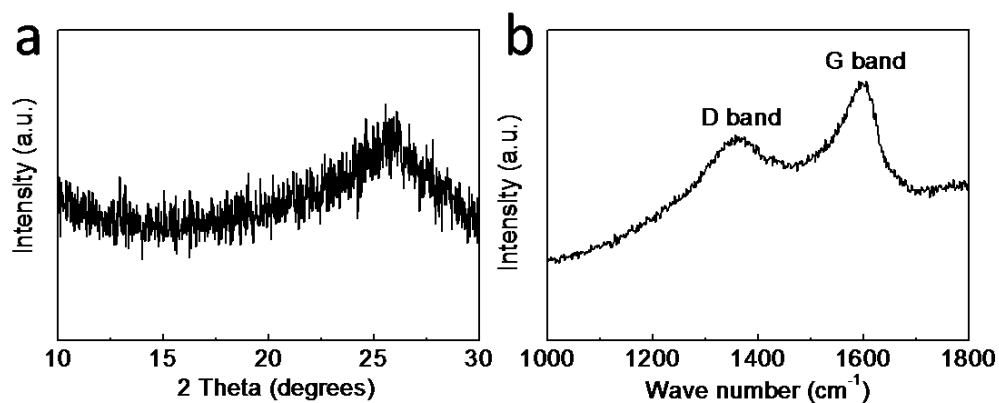
**Fig.S1** Fourier transform infrared spectra of pure NTA and Ni-NTA precursor.



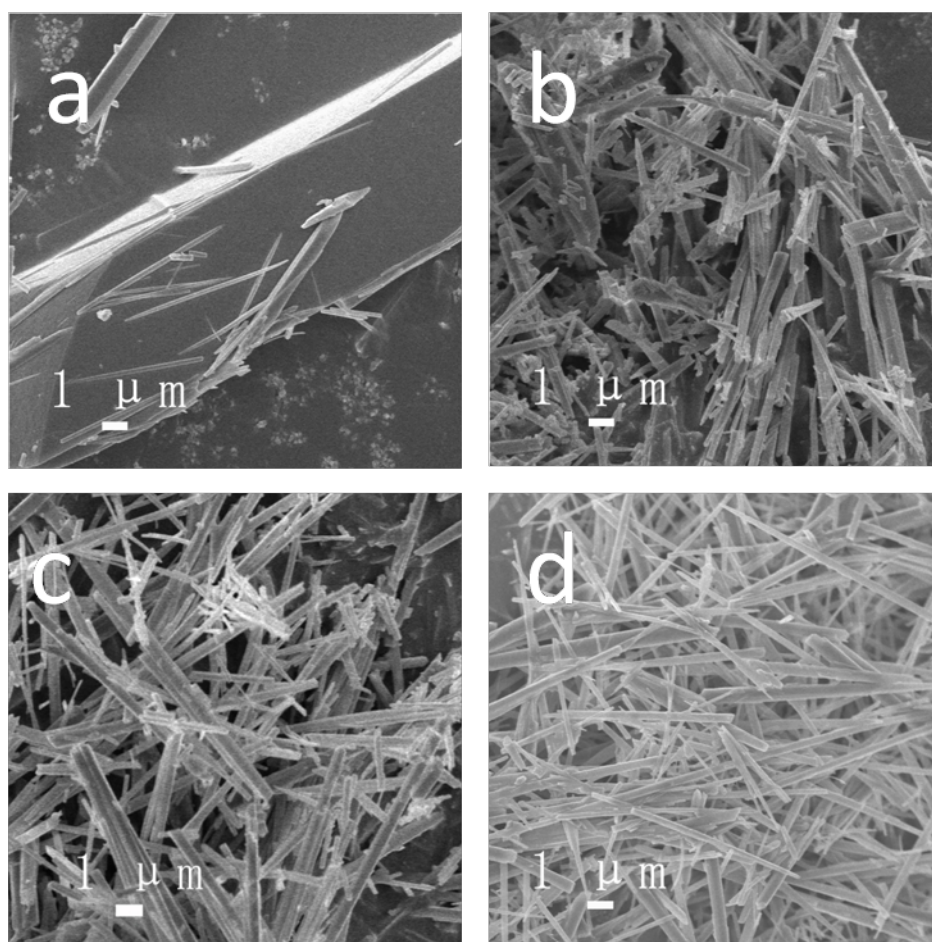
**Fig.S2** FESEM images (a-b) and TEM images (c-d) of the Ni-NTA precursor with different magnification.



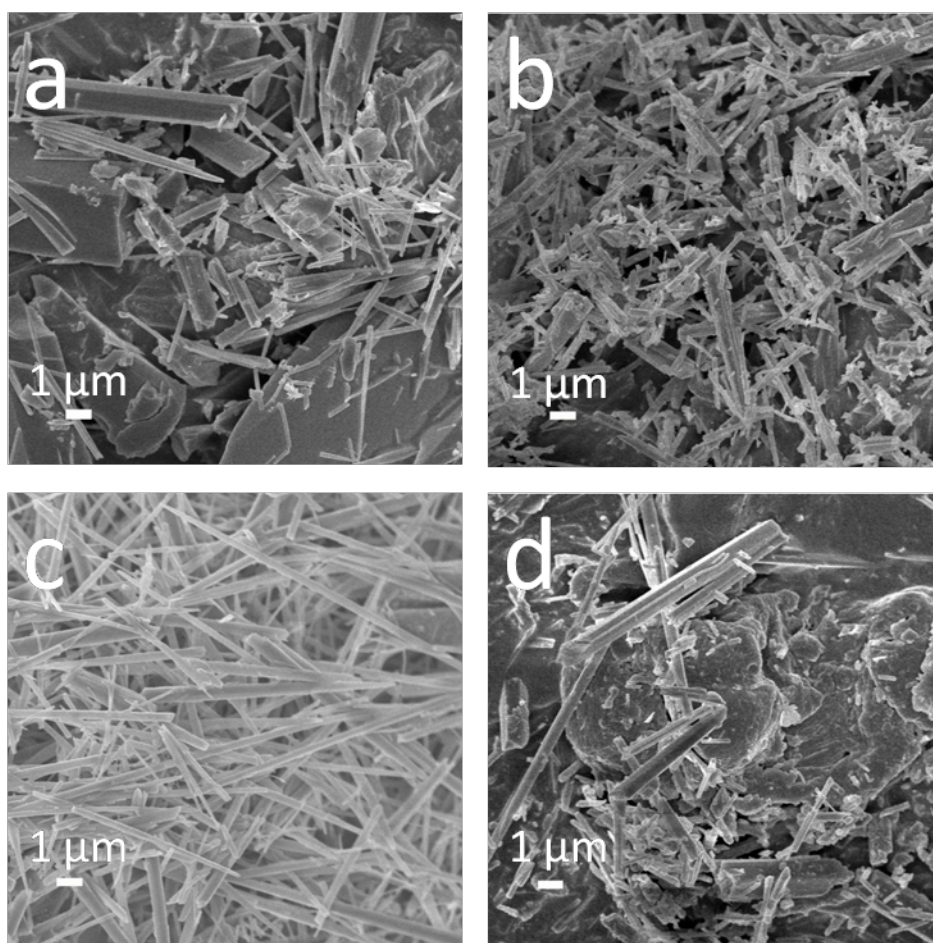
**Fig.S3** The thermogravimetric analysis and different thermal analysis (TG-DTA) curve of the Ni-NTA precursor.



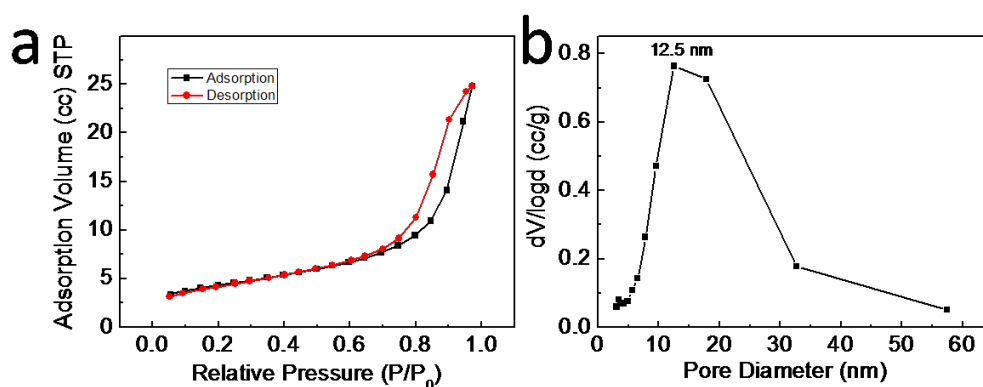
**Fig.S4** (a) XPD pattern, (b) Raman spectrum of the obtained Ni@C composite.



**Fig.S5** SEM images of the precursors prepared with different reaction times of 1 h (a), 2 h (b), 4 h (c) and 6 h (d).



**Fig.S6** SEM images of the precursors obtained at (a) 140 °C, (b) 160 °C, (c) 180 °C and (d) 200 °C.



**Fig.S7** Nitrogen adsorption and desorption isotherms (a) and its corresponding pore size distribution curves (b) of the as-prepared Ni@C composite.

Table S1 Decomposition peak temperature of MgH<sub>2</sub>-5wt%Ni@C composites determined by DSC

Heating rate (°C)	DSC (°C)
2	282.1
5	306
10	325.1
20	342.3