



Fig. S1 Thermal programmed desorption with temperature ramp (2 °C/min) up to 450 °C and prolonged desorption at this final temperature for LiBH₄@C-MSU-H 1 at% Ni and LiBH₄@C-MSU-H 1at% N rehydrogenated nanocomposites.

Table S1 The comparison of the hydrogen storage performances of LiBH₄@C-MSU-H 1 at% N nanocomposites studied in the present work with those presented in state of the art literature for LiBH₄- based systems

Composite	Desorption peak temperature (°C)	Activation energy of desorption (kJ/mol)	Reversible hydrogen storage capacity	Reference
LiBH ₄ @C-MSU-H 1 at% N	318	119.5	6.14 wt%	This work
LiBH ₄ @CoNi doped hollow carbon frameworks	355	95.4	9.4 wt% (referred to LiBH ₄)	10
LiBH ₄ nanoparticles/Ni doped graphene	285	106	8.5 wt%	18
LiBH ₄ @carbon wrapped Fe ₃ O ₄ nanospheres	337	108.1	6.2 wt%	11
LiBH ₄ @double layer carbon nanobowl	353	121.4	8.5 wt%	6
LiBH ₄ @TiO ₂ decorated porous carbonaceous network	316	91.56	5.1 wt%	12
LiBH ₄ @N-doped carbon nanosheet embedded with Co nanoparticles	372	86.2	9.7 wt% (referred to LiBH ₄)	13
LiBH ₄ -FeF ₂ /FeO _x doped graphene	375	98.9	5.5 wt%	16
LiBH ₄ @Ni nanoparticles coated with porous hollow carbon microspheres	340	98.9	8.86 wt% (referred to LiBH ₄)	14
LiBH ₄ -high entropy metal oxide nanoplates	364.8	116.13	6.38 wt%	17

References from Table S1

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