Enhanced hydrogen storage property of MgH_2 by the nanocatalyst $BaCrO_4$

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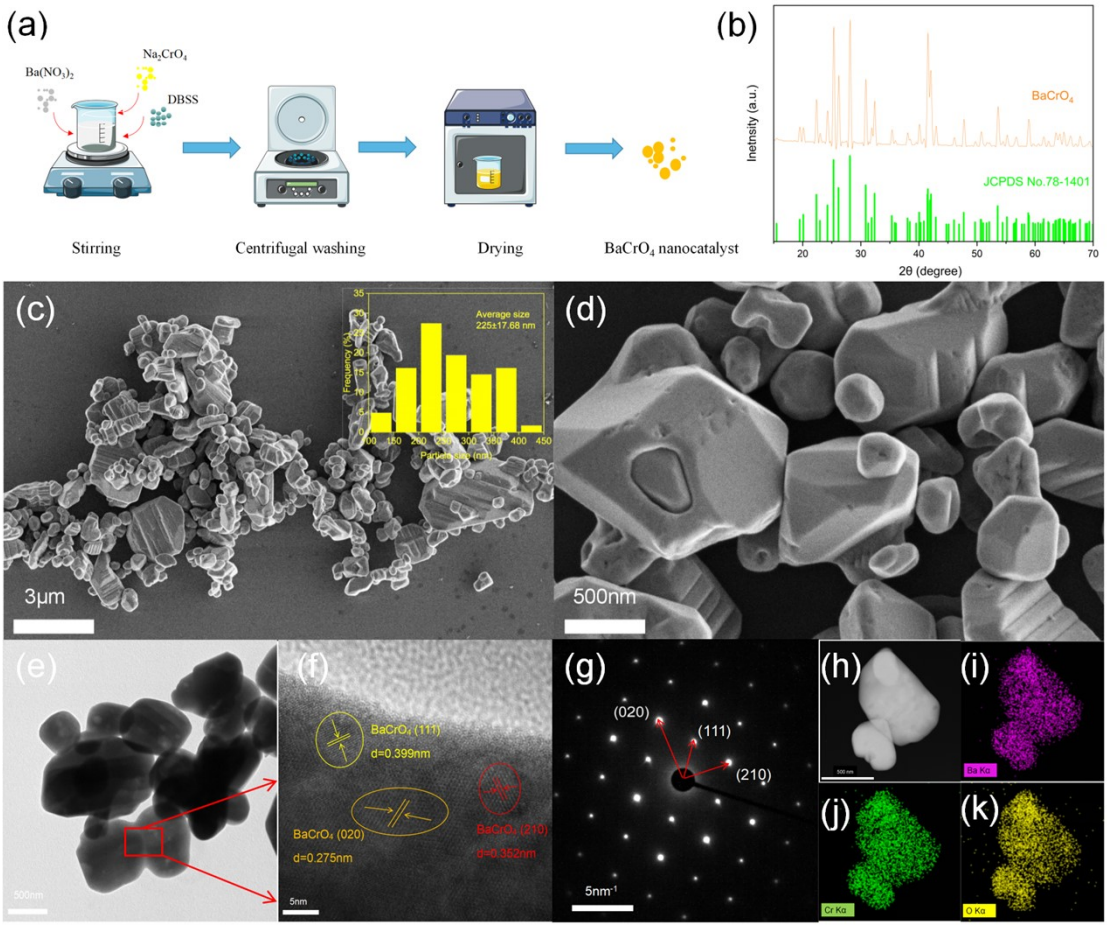

Fig. S1 (a) Preparation process of the $BaCrO_4$ nanocatalyst, (b) XRD patterns, (c-d) SEM profiles and particle size distribution, (e-f) HRTEM image, (g) SAED image and (h-k) EDS mapping graphs of $BaCrO_4$ nanocayalyst.

Fig S2 EDS element composition of $BaCrO_4$ nanocatalyst.

Sample	Element	Atom %
$BaCrO_4$ nanocatalyst	Ba	17.00
	Cr	13.40
	O	69.60
	Total	100

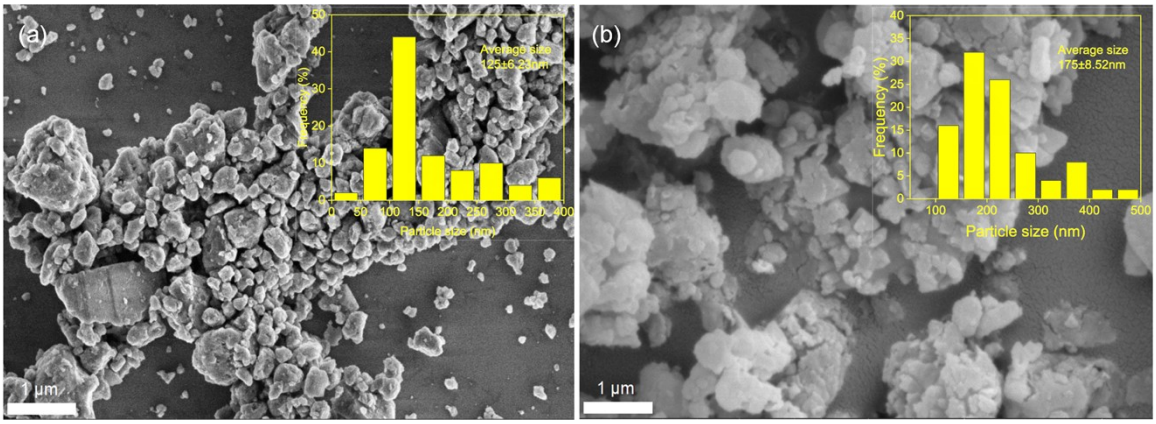

Fig. S3 SEM images and particle size distribution of (a) as-milled and (b) cycling states of 10 wt% $BaCrO_4$ introduced-MgH_2 .

Fig S4 EDS element composition of 10 wt% $BaCrO_4$-introduced MgH_2 at different states.

Sample	Element	Atom %
10 wt% $BaCrO_4$-introduced MgH_2 after milling	Ba	1.00
	Cr	0.70
	O	11.50
	Mg	86.80
	Total	100
10 wt% $BaCrO_4$-introduced MgH_2 after dehydrogenation	Ba	0.88
	Cr	0.71
	O	30.24
	Mg	68.17
	Total	100
10 wt% $BaCrO_4$-introduced MgH_2 after rehydrogenation	Ba	0.96
	Cr	1.13
	O	19.05
	Mg	78.86
	Total	100

Table S1 Bond length analysis of MgH_2 and 10 wt% $BaCrO_4$-introduced MgH_2.

Material	Average bond length of Mg-H
MgH_2	1.935 Å
10 wt% $BaCrO_4$-introduced MgH_2	2.904 Å