

Supporting Information for

A high energy-density P2- $\text{Na}_{2/3}[\text{Ni}_{0.3}\text{Co}_{0.1}\text{Mn}_{0.6}]\text{O}_2$ cathode with mitigated
P2-O2 transition for sodium-ion batteries

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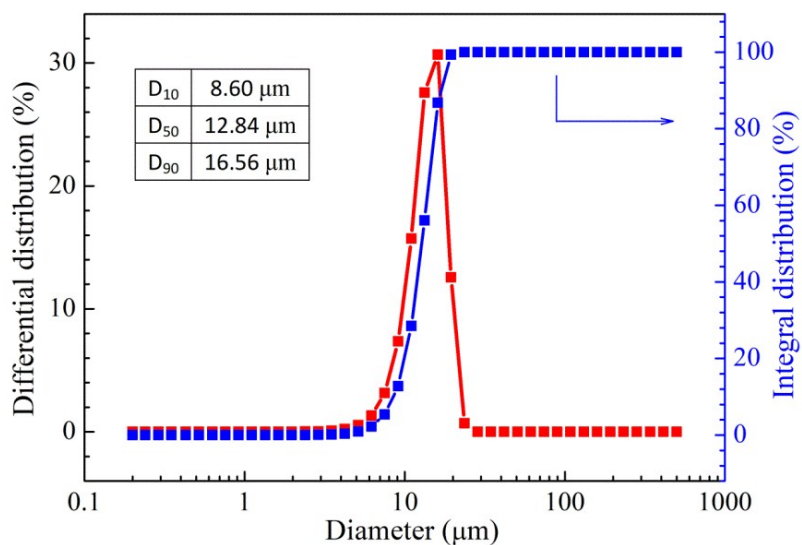


Figure S1 Particle size and distribution of the as-prepared hydroxide precursors $[\text{Ni}_{0.3}\text{Co}_{0.1}\text{Mn}_{0.6}](\text{OH})_2$.

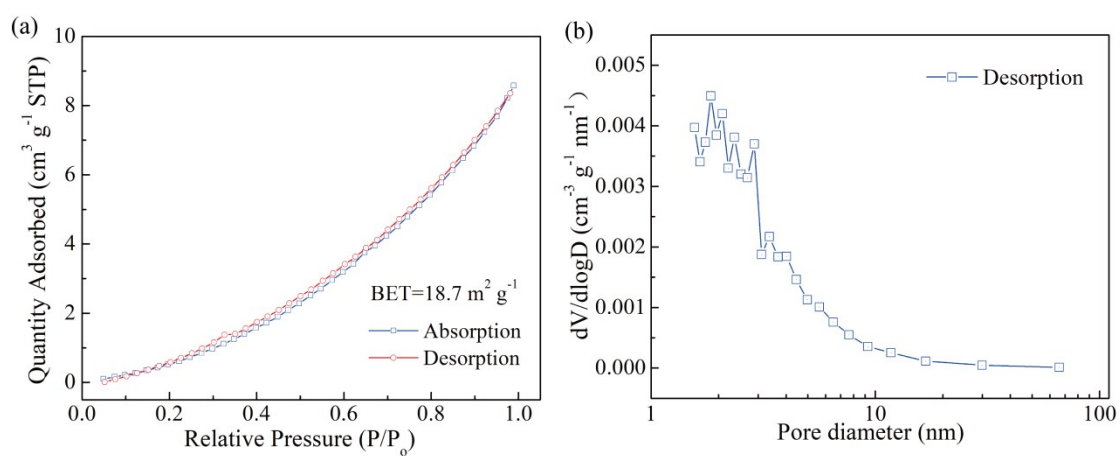


Figure S2 (a) Nitrogen adsorption/desorption isotherms at 77 K, and (b) the pore size distribution of $\text{P2-Na}_{2/3}[\text{Ni}_{0.3}\text{Co}_{0.1}\text{Mn}_{0.6}]\text{O}_2$ cathode material.

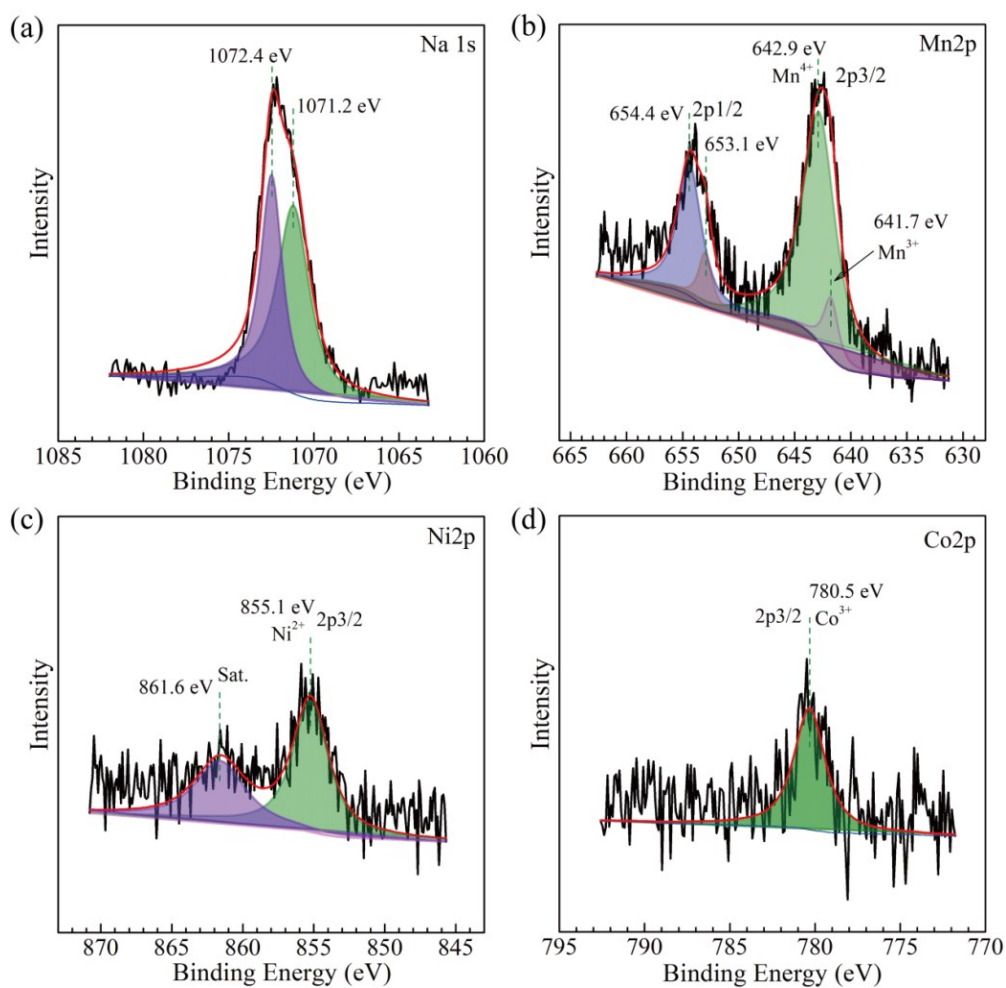


Figure S3 XPS of the pristine P2-Na_{2/3}[Ni_{0.3}Co_{0.1}Mn_{0.6}]O₂: (a) Na 1s, (b) Mn 2p, (c) Ni 2p, and (d) Co 2p.

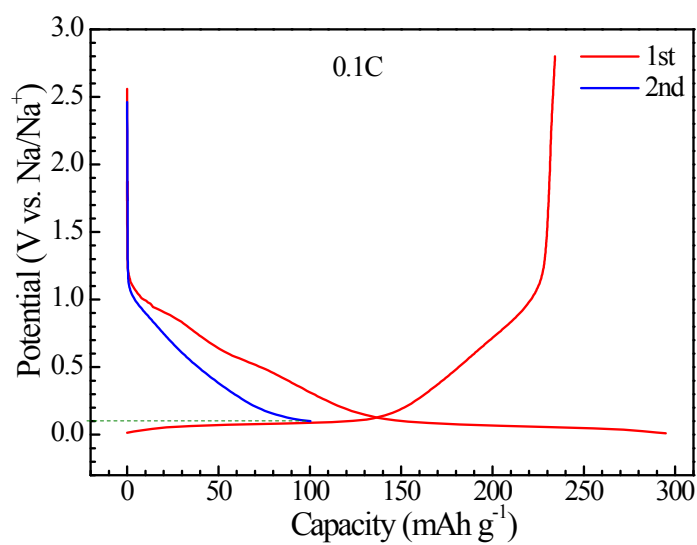


Figure S4 The charge/discharge curves of hard carbon used as anode in full-cells.

Table S1 A comparison of high-rate capability of the modified P2- $\text{Na}_{2/3}[\text{Ni}_{0.33}\text{Mn}_{0.67}]\text{O}_2$ cathodes *via* bulk doping or surface coating in the recent literatures.

Structural formula	Modified method	Voltage range (V vs Na/Na ⁺)	Cathode loading (mg cm ⁻²)	Capacity at 0.1C (mAh g ⁻¹)	Capacity at high rates (mAh g ⁻¹)	Ref
$\text{Na}_{2/3}[\text{Ni}_{0.3}\text{Co}_{0.1}\text{Mn}_{0.6}]\text{O}_2$	Co doping	2.0–4.3	2.0–2.5	161.6	110 (5C) 91 (10C)	This work
$\text{Na}_{0.8}[\text{Li}_{0.12}\text{Ni}_{0.22}\text{Mn}_{0.66}]\text{O}_2$	Li doping	2.0–4.4	NA	118	70 (5C)	1
$\text{Na}_{2/3}[\text{Ni}_{1/3}\text{Mn}_{1/2}\text{Ti}_{1/6}]\text{O}_2$	Ti doping	2.5–4.35	4.1	120	90 (2C)	2
$\text{Na}_{2/3}[\text{Ni}_{0.2}\text{Cu}_{0.1}\text{Mn}_{0.7}]\text{O}_2$	Cu doping	2.0–4.5	NA	125	30 (5C)	3
$\text{Na}_{2/3}[\text{Cu}_{1/12}\text{Ni}_{1/4}\text{Mn}_{2/3}]\text{O}_2$	Cu doping	2.5–4.4	NA	~130	85 (5C)	4
$\text{Na}_{2/3}[\text{Mn}_{0.67}\text{Ni}_{0.28}\text{Mg}_{0.05}]\text{O}_2$	Mg doping	2.5–4.35	~4.0	135	25 (2C)	5
$\text{Na}_{2/3}[\text{Ni}_{0.23}\text{Mg}_{0.1}\text{Mn}_{0.67}]\text{O}_2$	Mg doping	2.0–4.5	NA	105 (0.3C)	80 (~2.5C)	6
$\text{Na}_{2/3}[\text{Mn}_{0.7}\text{Ni}_{0.25}\text{Mg}_{0.05}]\text{O}_2$	Mg doping	2.0–4.5	5.81	136	105 (3C)	7
$\text{Na}_{2/3}[\text{Ni}_{0.26}\text{Zn}_{0.07}\text{Mn}_{0.67}]\text{O}_2$	Zn doping	2.0–4.4	NA	132	79 (5C)	8
$\text{Na}_{2/3}[\text{Ni}_{1/3}\text{Fe}_{1/12}\text{Mn}_{7/12}]\text{O}_2$	Fe doping	2.2–4.4	NA	141	84.6 (10C)	9
$\text{Na}_{2/3}[\text{Ni}_{1/3}\text{Mn}_{2/3}]\text{O}_2$	Al ₂ O ₃ coating	2.5–4.3	1.5	164	65.3 (3C)	10
$\text{Na}_{0.5}[\text{Ni}_{0.26}\text{Cu}_{0.07}\text{Mn}_{0.67}]\text{O}_2$	Cu doping with MgO coating	2.0–4.5	2.5	131	83 (5C)	11

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