Electronic Supplementary Material (ESI) for Environmental Science: Nano.

Engineering of 3D Na_xCoO_2 Nanostructures for Enhanced Capacitive Deionization: Performance and Mechanism

Wei Si,[a b] Zhenzhen Liu,[a] Zehao Zhang,[b] Wenxin Ji,[a] Haibo Li[a b *]

a. State Key Laboratory of High-efficiency Utilization of coal and Green Chemical Engineering, Ningxia University, Yinchuan 750021, China

b. Ningxia Key Laboratory of Photovoltaic Materials, Ningxia University, Yinchuan, Ningxia, 750021, China

∗Corresponding author. Fax/Tel.: +86 0951 2062414; E-mail: lihaibo@nxu.edu.cn (Haibo Li)

Table S1. The comparison on the pore texture of Na_xCoO_2.

Sample	S_{BET} (m^2 g^{-1})	V (cm^3 g^{-1})	D_{avg} (nm)
$Na_{0.2}CoO_2$ [22]	3.832	0.048	50.3
$Na_{0.5}CoO_2$[22]	2.827	0.031	43.571
$Na_{0.7}CoO_2$[22]	3.260	0.049	59.934
$Na_{1.0}CoO_2$[22]	1.552	0.013	33.202
$Na_{1.6}CoO_2$[22]	1.720	0.013	30.261
3D $Na_{0.6}CoO_2$	4.232	0.026	24.569

Table S2. The elemental ratio of Na_xCoO_2 upon the desalination.

Time (min)	Na	Co	O
0	7.29%	23.10%	69.61%
5	4.67%	32.64%	62.69%
60	6.28%	30.35%	63.37%
90	3.30%	31.68%	65.02%

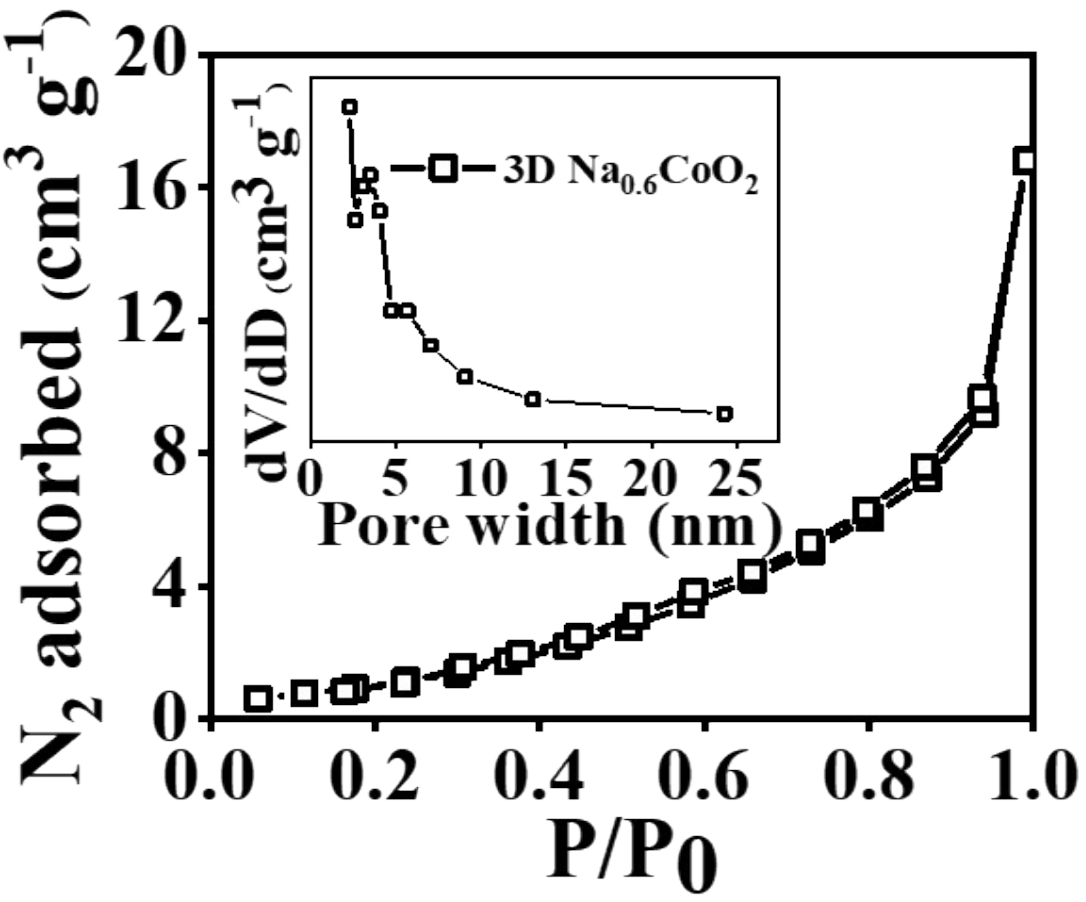

Figure S1 N_2 adsorption-desorption isotherm and pore size distribution of 3D $Na_{0.6}CoO_2$

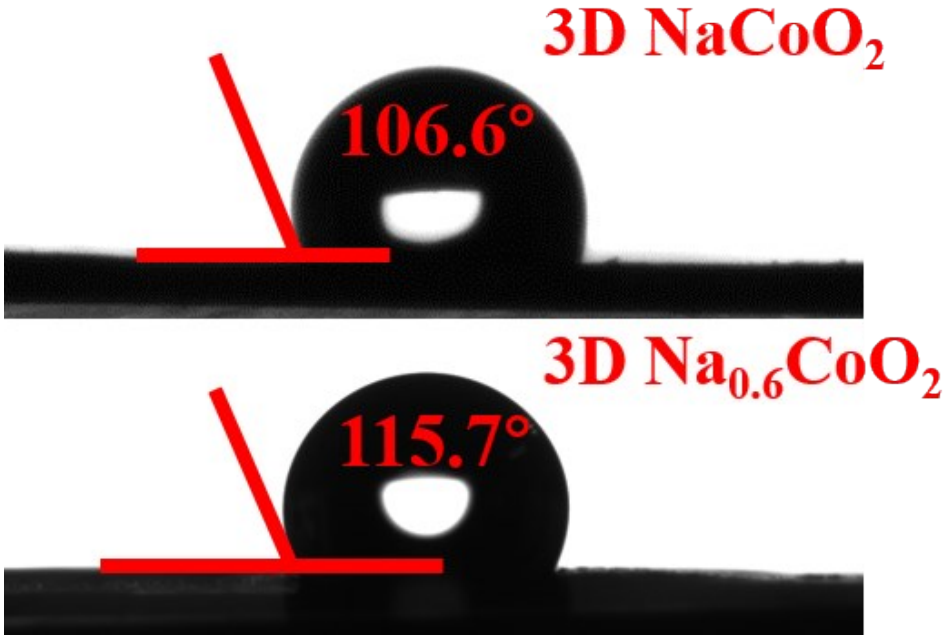

Figure S2 contact angle image of 3D $NaCoO_2$ and 3D $Na_{0.6}CoO_2$.

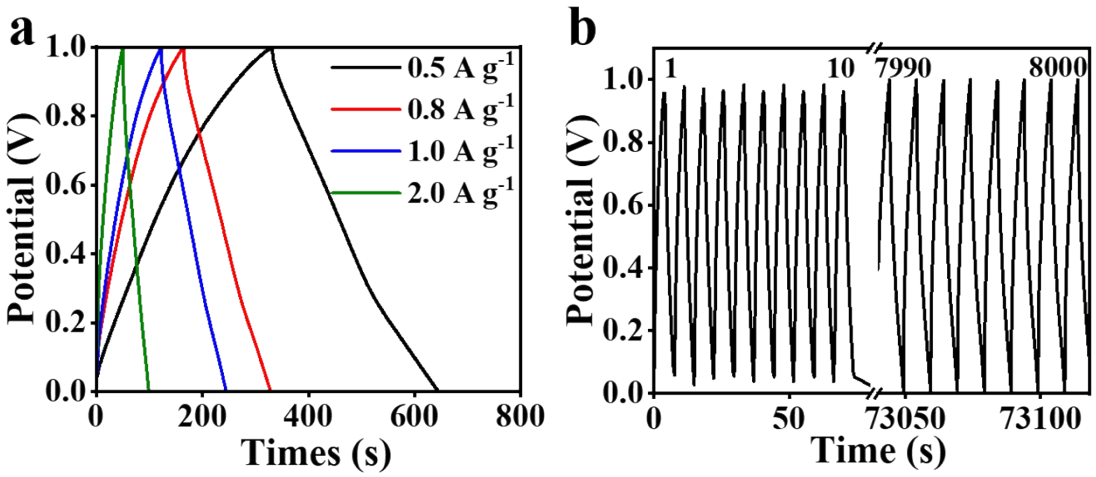

Figure S3 (a) GCD under different current densities (0.5, 0.8, 1.0, 2.0 A g^{-1}), (b) 8000 cycles GCD tests under 10 A g^{-1} current density.

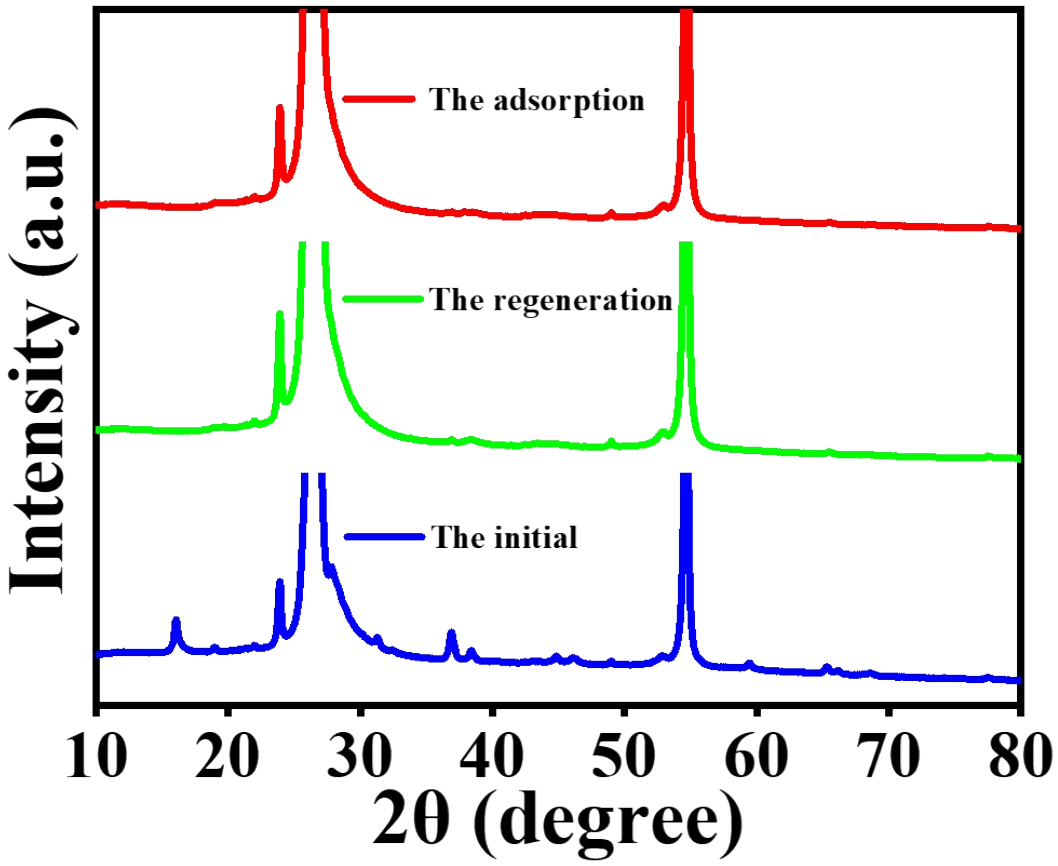

Figure S4. The XRD patterns of 3D $Na_{0.6}CoO_2$ in different states.

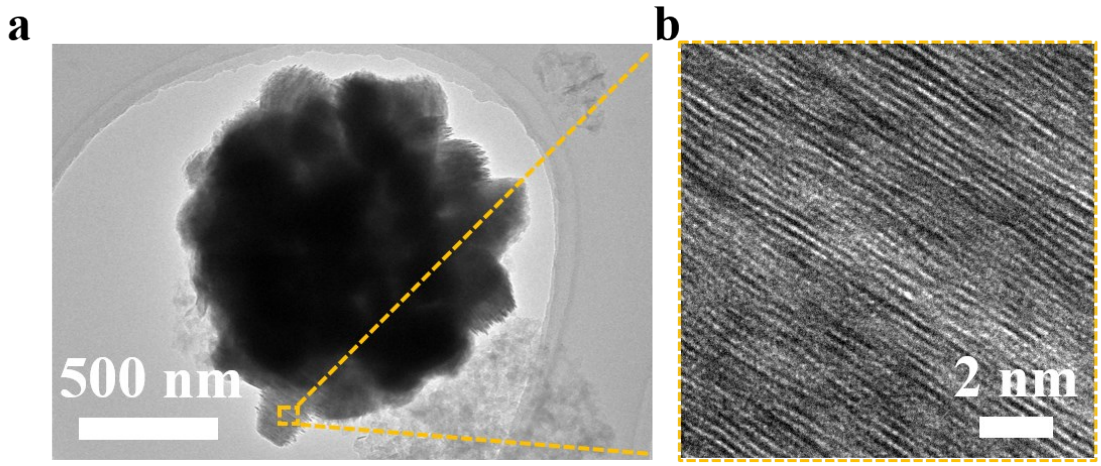

Figure S5 The TEM images of 3D $Na_{0.6}CoO_2$ at low (a) and high (b) magnification after the adsorption.