Supporting Information

Carbon Dots Supported upon N-doped TiO_2 Nanorod Applied into Sodium and Lithium Ion Batteries

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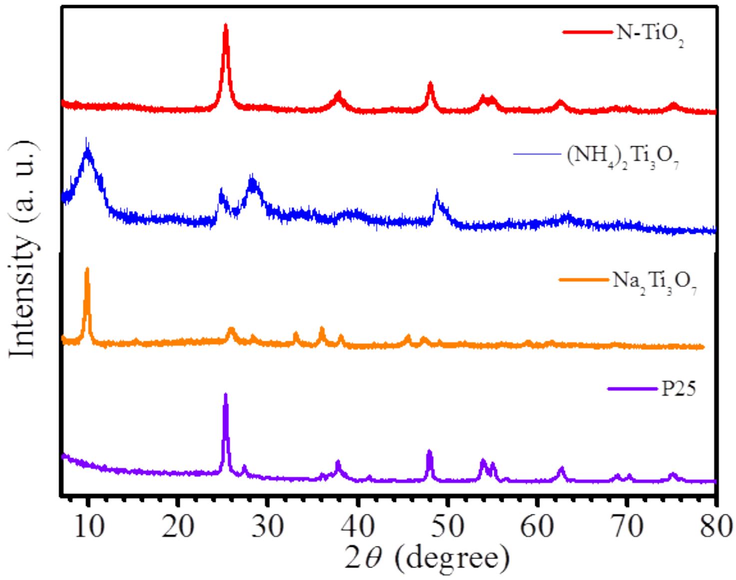

Figure S1. XRD patterns of the raw materials (P25), the intermediate $Na_2Ti_3O_7$, $(NH_4)_2Ti_3O_7$ and the product N-TiO_2.

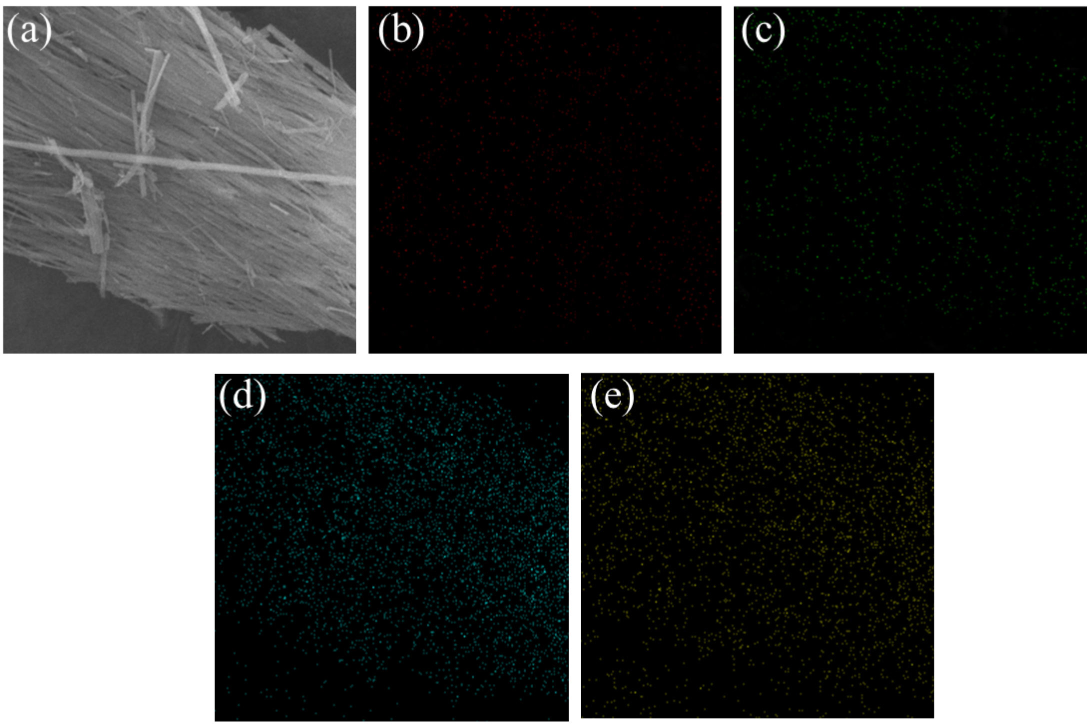

Figure S2. Elemental distribution of N-TiO_2/C-dots probed by EDS-mapping: (a) SEM image, distribution of (b) C, (c) N, (d) Ti and (e) O.

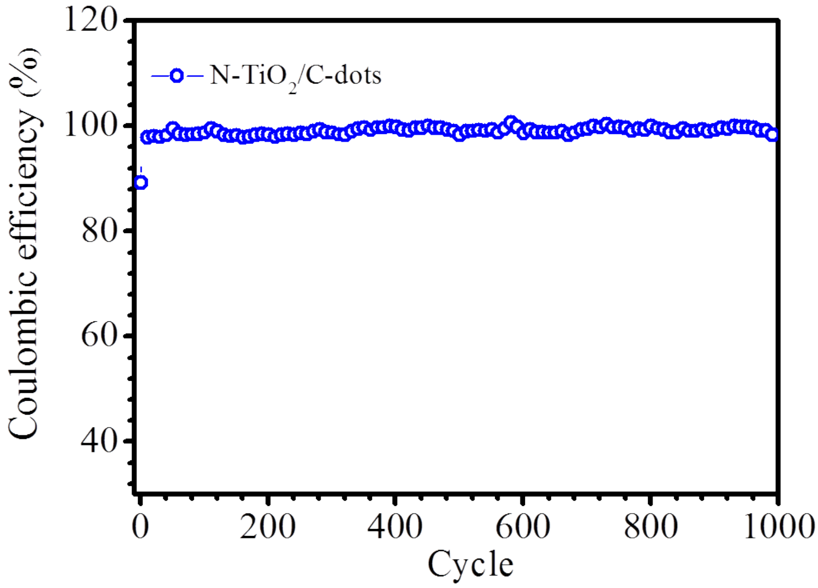

Figure S3. Coulombic efficiency of lithium-ion batteries employing the N-TiO_2/C-dots anodes.

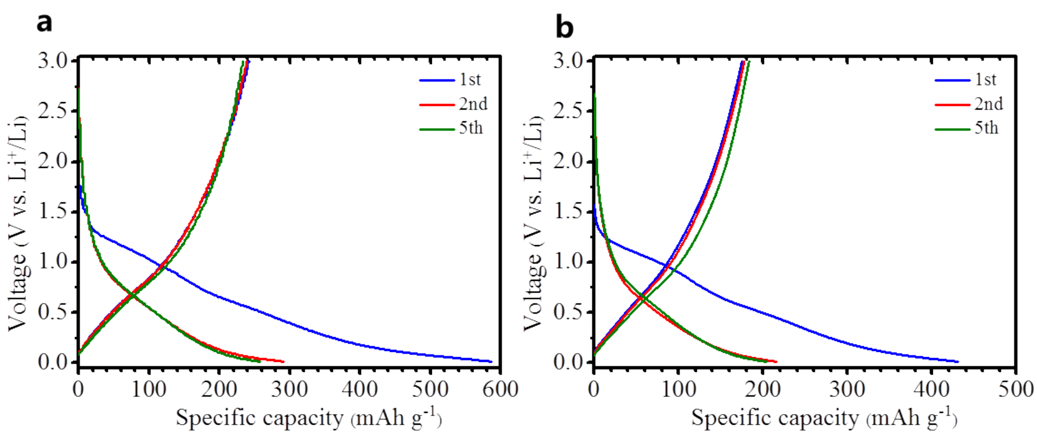

Figure S4. Galvanostatic charge–discharge profiles of the first, second and fifth cycles of sodium-ion batteries employing the (a) N-TiO_2/C-dots composite and (b) pure N-TiO_2 anodes at 0.5 C.

Table S1. Capacitive capacity of lithium-ion batteries employing the N-TiO_2/C-dots composite and pure N-TiO_2 anodes at various rates.

Anodes	Rate (C)	Capacitive charge capacity q_c (mAh g^{-1})	Total capacity q_t (mAh g^{-1})	q_c/q_t (%)
N-TiO_2/C-dots	2	143	260	55.0
	5	130	235	55.3
	10	117	208	56.2
	20	104	176	59.1
	50	93	145	64.1
	100	77	116	66.4
N-TiO_2	2	125	217	57.6
	5	106	173	61.3
	10	91	145	62.8
	20	84	115	73.0
	50	55	72	76.0
	100	~36	36	~100

Table S2. Cycling performance and rate performance of the structured TiO_2 materials reported recently for lithium-ion battery anodes (1 C = 168 mA g^{-1}).

Compound	Crystalline	Capacity at low rate [mAh g^{-1}]	Capacity at high rate [mAh g^{-1}]	Capacity retention at 10 C	Ref.
TiO_2(B) nanotube	TiO_2(B)	220 at 0.3 C	134 at 10 C	~78.3% over 80 cycles	1
TiO_2/graphene	anatase	230 at 0.1 C	80 at 50 C	98% over 100 cycles	2
3D TiO_2/CNT	anatase	~270 at 0.5 C	~113 at 100 C	87% over 1000 cycles (20 C)	3
Nanoporous TiO_2	anatase	~302 at 0.4 C	~46 at 119 C	~91.6% over 100 cycles	4
TiO_2–B/Anatase	TiO_2(B)/anatase	235 at 0.6 C	160 at 35.7 C	~97% over 100 cycles (35.7 C)	5
N-doped TiO_2	anatase	182 at 0.5 C	~45 at 15 C	~97% over 100 cycles (0.5 C)	6
N-TiO_2 nanorods	anatase/TiO_2(B)	217 at 2 C	36 at 100 C	83.8% over 1000 cycles	*This work*
N-TiO_2 nanorods/ C-dots	anatase/TiO_2(B)	260 at 2 C	116 at 100 C	91.6% over 1000 cycles	*This work*

Table S3. Cycling performance and rate performance of the structured TiO_2 materials reported recently for sodium-ion battery anodes (1 C = 168 mA g^{-1}).

Compound	Crystalline	Capacity at low rate [mAh g^{-1}]	Capacity at high rate [mAh g^{-1}]	Capacity retention	Ref.
TiO_2 nanotube	amorphous	120 at 0.3 C	/	/	7
TiO_2(H)	hollandite	85 at 0.25 C	/	/	8
TiO_2(B) nanotube	TiO_2(B)	87 at 0.24 C	33 at 2.4 C	~57% over 100 cycles at 0.3 C	9
TiO_2/N-graphene	anatase	405 at 0.06 C	140 at 6 C	~74% over 100 cycles at 0.6 C	10
TiO_2 nanorods/C	anatase	193 at 0.5 C	~104 at 20 C	90.7% over 50 cycles at 10 C	11
TiO_2 NC	anatase	~190 at 0.3 C	~50 at 12 C	~79% over 100 cycles at 0.3 C	12
TiO_2 nanoparticles	anatase	~150 at 0.4 C	86 at 22 C	82% over 1000 cycles at 11 C	13
C‐TiO_2	anatase	155 at 0.12 C	82.7 at 12 C	~100% over 50 cycles at 0.12 C	14
TiO_2 spheres	anatase/TiO_2(B)	~173 at 0.5 C	105 at 5 C	~80% over 50 cycles at 1 C	15
N-TiO_2 nanorods	anatase/TiO_2(B)	218 at 0.5 C	40 at 20 C	78.1% over 300 cycles at 5 C	*This work*
N-TiO_2 nanorods/ C-dots	anatase/TiO_2(B)	258 at 0.5 C	131 at 20 C	93.6% over 300 cycles at 5 C	*This work*

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