Supporting Information

New Facile Synthesis of TiO₂ Hollow Sphere with an Opening Hole and Its Enhanced Rate Performance in Lithium-ion Battery

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Figure S1 SEM images of TiO₂ spheres prepared at different BA/TNB mole ratio (R value): (a) R=1.2, (b) R=2.4, (c) R=3.8, (d) R=4.8, (e) R=12.0, (f) R=26.0.

Scale bar: 5 μm.
Figure S2 SEM images of TiO$_2$ spheres prepared at different OA/TNB mole ratio ($R$ value): (a) $R=1.0$, (b) $R=2.0$, (c) $R=2.8$, (d) $R=4.3$, (e) $R=11.0$, (f) $R=22.0$. 

Scale bar: 10 μm.
**Figure S3** SEM images of TiO$_2$ spheres prepared at different AA/TNB mole ratio ($R$ value): (a) $R$=1.5, (b) $R$=3.0, (c) $R$=6.0, (d) $R$=9.0, (e) $R$=18.0, (f) $R$=36.0. Scale bar: 5 μm.
**Figure S4** XRD patterns of the TiO$_2$ spheres prepared at different HA/TNB mole ratio (R value)

**Figure S5** SEM images of the TiO$_2$ spheres prepared at different HA/TNB mole ratio (R value): (a) $R=3$; (b) $R=25$. 
Figure S6 The nitrogen adsorption-desorption isotherms (a) and the corresponding pore size distribution (b) calculated from the desorption branches by BJH method.
**Figure S7** Cyclic voltammograms of different TiO$_2$ spheres prepared at two HA/TNB mole ratio ($R$ value), scanning rate: 0.1 mV/s.

**Figure S8** The electrochemical impedance spectroscopy (EIS) of different TiO$_2$ spheres prepared at two HA/TNB mole ratio ($R$ value)