Supporting Information

A Reversible Phase Transition for Sodium Insertion in Anatase TiO$_2$

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Figure S1. Powder x-ray diffraction pattern of anatase TiO$_2$. 
Figure S2. Cycling behavior of anatase TiO$_2$ upon Na insertion/de-insertion. The capacity obtained after 50 cycles is 165 mAh/g, corresponding to ca. 0.5 Na$^+$ per TiO$_2$. 
Figure S3. (a) High-energy X-ray diffraction pattern of the pristine and fully discharged TiO$_2$ electrodes. (b) The X-ray diffraction pattern of the fully discharged electrode was indexed with an O3-type NaTiO$_2$ rhombohedral structure (space group: R-3m).
Figure S4. PDF refinement of the TiO$_2$ electrode discharged to 0.3V, *i.e.* 0.3 Na$^+$ per TiO$_2$.

Figure S5. High-energy X-ray diffraction pattern of the fully charged electrode. The peak at 2-theta $\approx 25^\circ$ can be assigned to the (101) of the anatase type structure, indicating the recovery of anatase framework upon charging.
Figure S6. PDF refinement of the electrode charged to 2 V using O3-type NaTiO$_2$ (space group: R-3m) and TiO$_2$ (space group: I4$_1$/amd) models. The results show that the desodiated electrode is composed by 20 % O3-type Na$_x$TiO$_2$ and 80 % TiO$_2$, which agrees with the capacity delivered during the 1$^{st}$ charge. Note that the high value of the Rw is due to strong disorder occurring in Na$_x$TiO$_2$ phase.