Supporting information (SI)

Observation of lithiation induced structural variations in TiO$_2$ nanotube arrays by X-ray absorption fine structures

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Figure S1 EDS spectra of the amorphous TiO$_2$ NT.

Figure S2 2-D display of excitation energy across the Ti L$_{3,2}$-edge and O K edge (y-axis) vs. fluorescence/scattered X-ray energy (x-axis) from Ti and O detected with a silicon drift detector (SDD). The fluorescence X-ray energy from Ti L$_{3,2}$ shell and O K shell, respectively, are marked with a vertical dotted line with the intensity colour coded. The Ti L and O K edge XANES is also shown (black trace).
Figure S3 O K edge XANES of Li$_2$CO$_3$ powder.

Figure S4 FLY spectrum of amorphous TiO$_2$ rooted on Ti foil.
Figure S5 First derivative spectra of Ti K edge XAFS for amorphous and anatase TiO$_2$, both before and after lithiation.

Figure S6. Ti K-edge EXAFS spectra ($k^3$-weighted) of (a) anatase and (b) amorphous TiO$_2$ both before and after lithiation.