

Supplementary Information

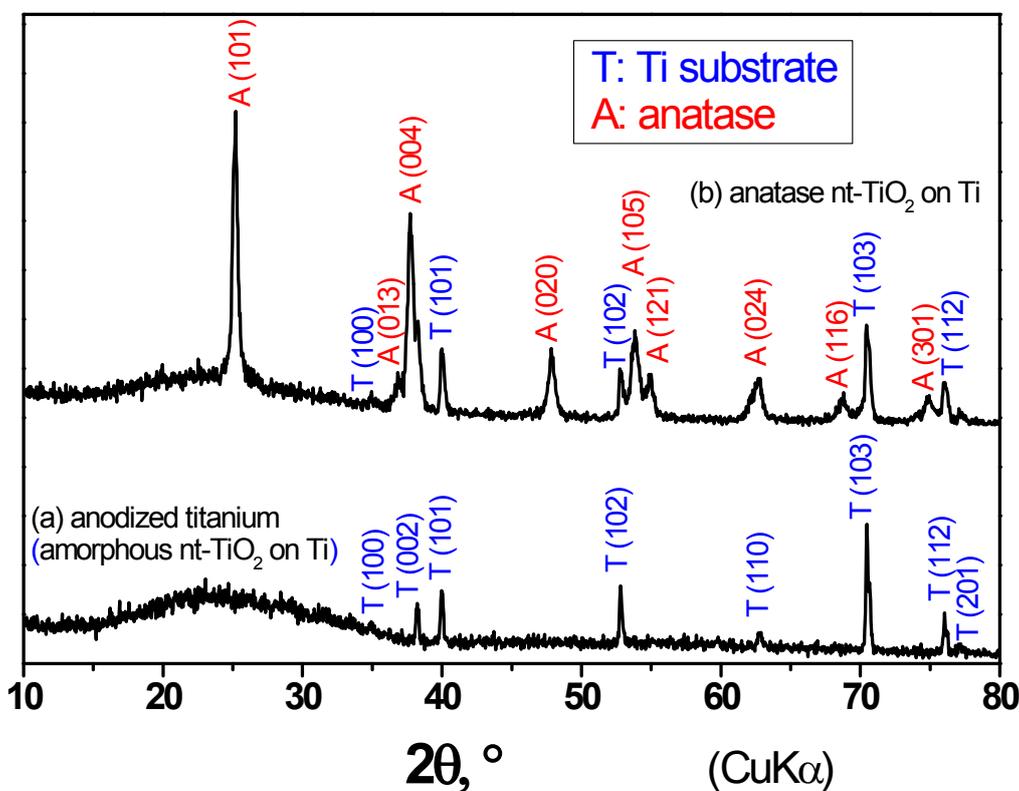


Figure S1. XRD for titanium anodized at 100 V during 40 min (single-wall nanotube): (a) before (amorphous nt-TiO₂ on Ti) and (b) after annealing at 550°C (SWANT). The Miller indexes are shown for Ti (substrate) and anatase phase.

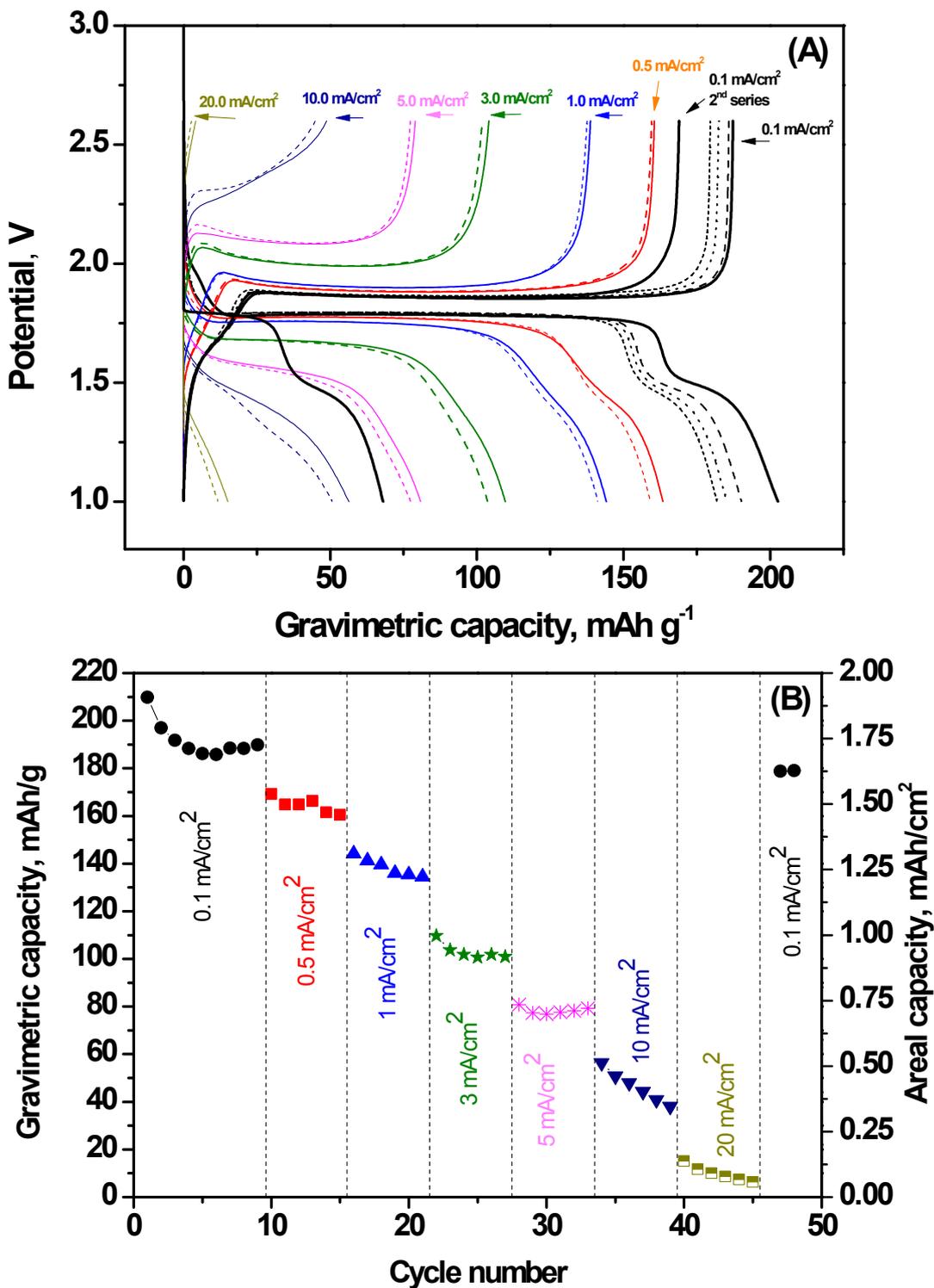


Figure S2. Results of galvanostatic cycling experiments for single-wall anatase nt-TiO₂ (100 V, 120 min, 550°C) in lithium cell under variable current density. (A) Potential-capacity plots. (B) Corresponding gravimetric capacity (mAh/g) and areal capacity (mAh/cm²) values measured in the discharge process as a function of cycle number. The mass of the electrode active material (SWANT) was determined by scraping the film of nt-TiO₂ from the titanium substrate and weighing in a microbalance.

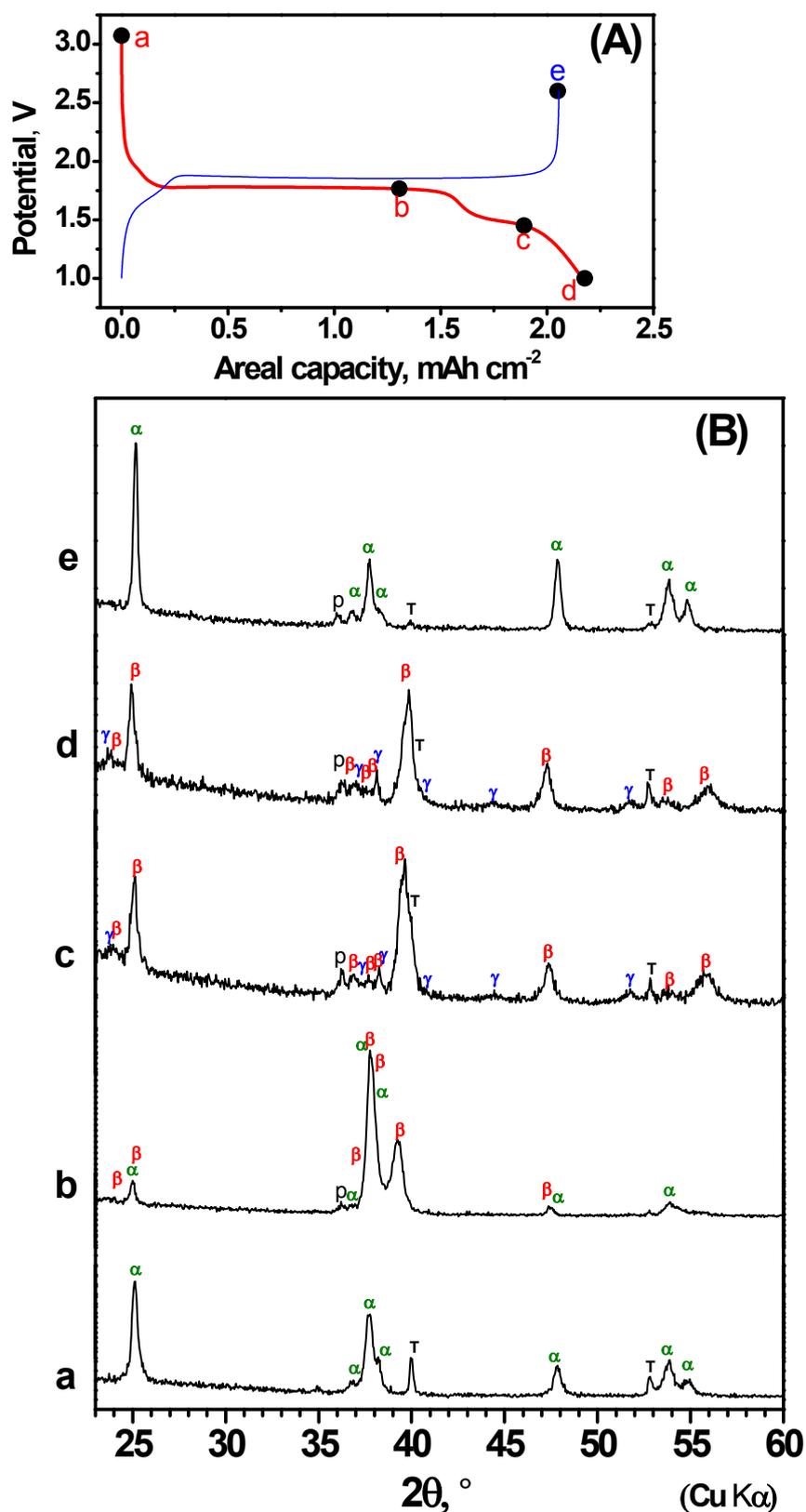


Figure S3. Study of the reaction between anatase single-wall anatase nt-TiO₂ (100 V, 45 min, 550°C) and lithium. (A) Potential-capacity plot for the first discharge-charge cycle. (B) Ex-situ XRD of nt-Li_xTiO₂ obtained at selected states of discharge (a-d) and charge (e). The Bragg reflections of α , β and γ phases² are marked. The peaks due to protective plastic film (p) and Ti substrate (T) are marked. Imposed current density: 0.1 mA/cm².

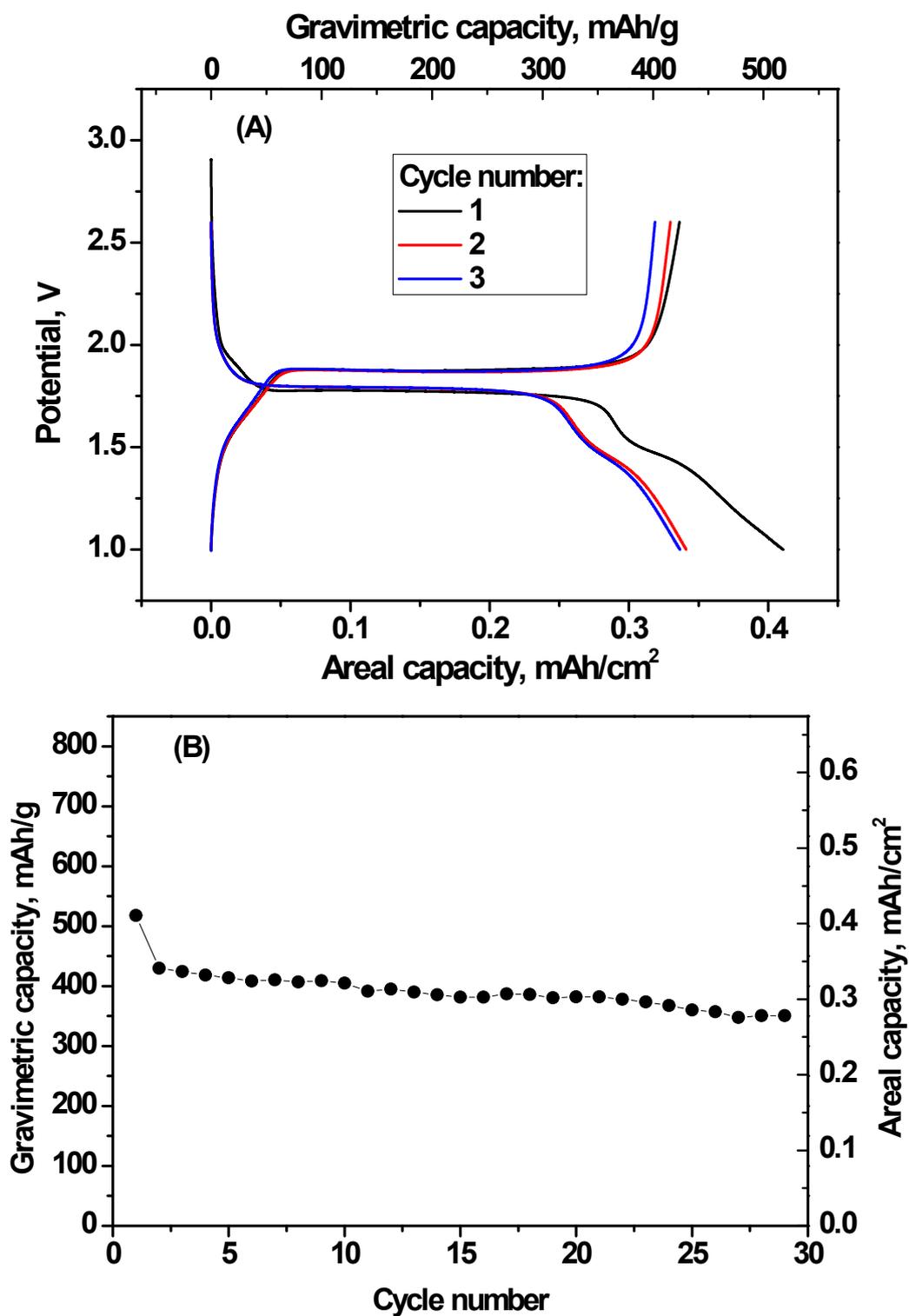


Figure S4. Electrochemical behavior of double-wall anatase nt-TiO₂ obtained by anodizing under ramping voltage ($V_{\text{anod}} = 20\text{-}100\text{ V}$, 2 h). (A) Potential-capacity plot. (B) Capacity as a function of cycle number. Imposed current density in lithium cell: 50 $\mu\text{A}/\text{cm}^2$. The gravimetric capacity was estimated by weighing the electrode mass before and after peeling-off the nt-TiO₂ film from the Ti-substrate.

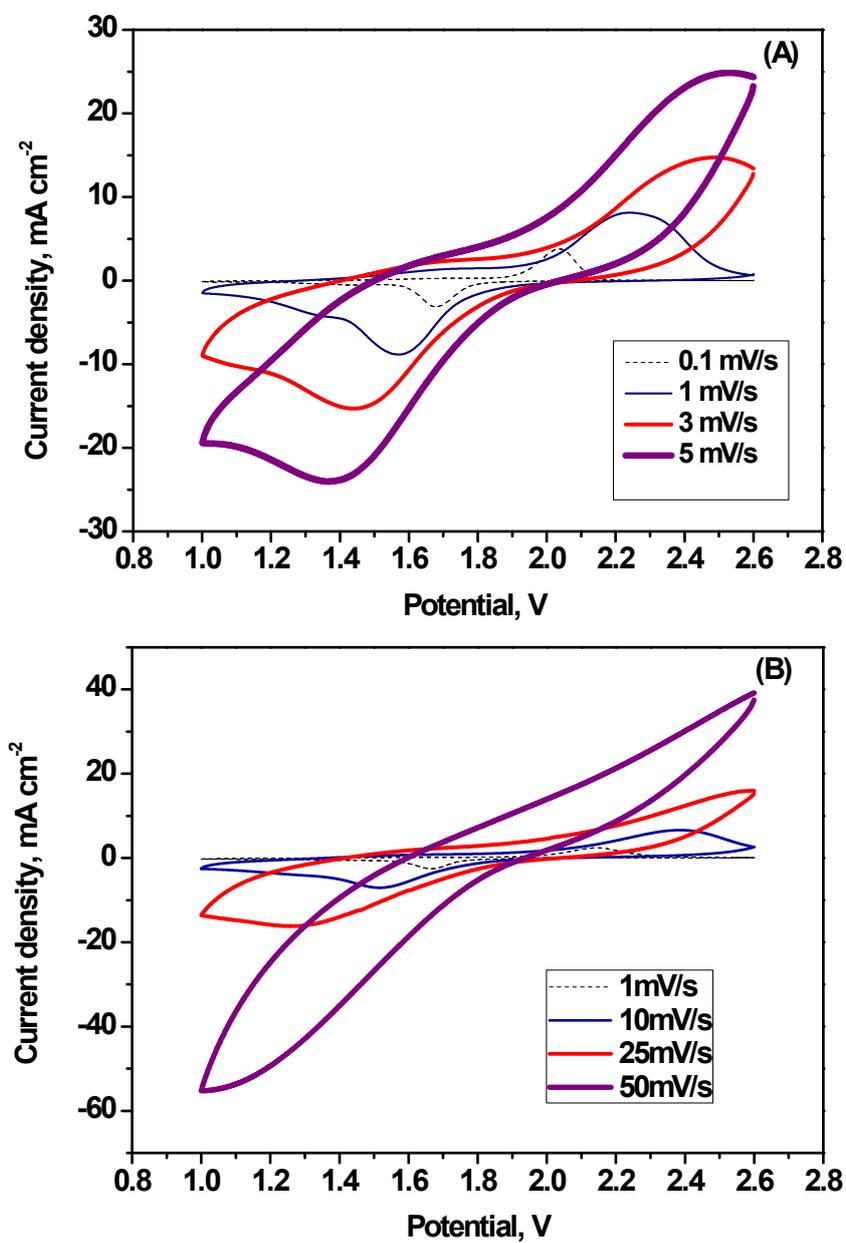


Figure S5. Current density vs. potential obtained by cyclic voltammetry for SWANT (A) and DWANT (B) in Li test cells.

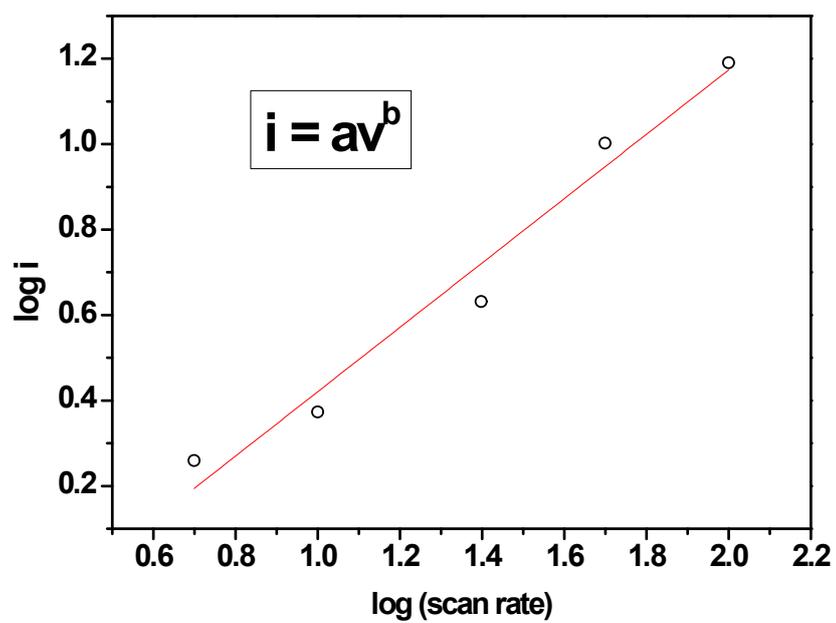


Figure S6. Example of the fitting of the experimental data obtained from cyclic voltammetry experiments to obtain the electrochemical b-parameter.

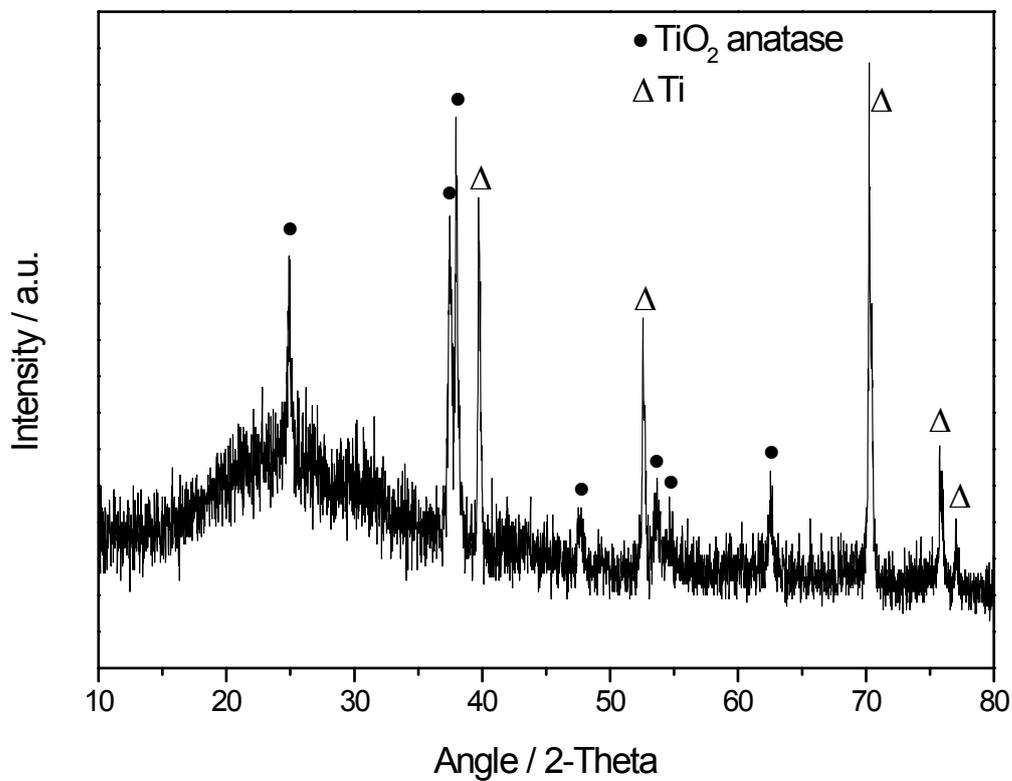


Figure S7. Ex-situ XRD of DWANT after electrochemical cycling in sodium cell. The electrode was protected against its reaction with air atmosphere. The reflections of anatase nanotube and Ti-substrate are preserved after electrochemical reaction with sodium.