

Supporting Information for:

Tailoring nanobranches in three-dimensional hierarchical rutile heterostructures: A case study of TiO₂-SnO₂

Sangbaek Park,[†] Sangwook Lee,[‡] Se Won Seo,[†] Seung-Deok Seo,[§] Chan Woo Lee,[†] Donghoe Kim,[†] Dong-Wan Kim,^{§,*} and Kug Sun Hong^{†,*}

[†] Department of Materials Science and Engineering, Seoul National University, Seoul 151-744, Korea

[‡] Department of Material Science and Engineering, University of California at Berkeley, CA94709, USA

[§] Department of Materials Science and Engineering, Ajou University, San 5, Woncheon-dong, Yeongtong-gu, Suwon 443-749, Korea

*To whom correspondence should be addressed. E-mail: dwkim@ajou.ac.kr and kshongss@plaza.snu.ac.kr

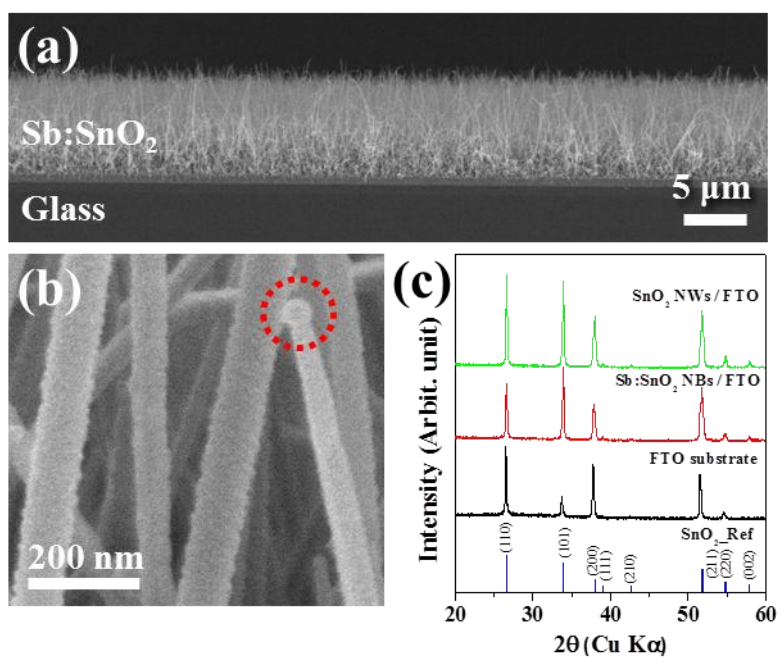


Fig. S1. (a) low and (b) high magnification of cross-sectional SEM images of the SnO₂ NBs, and (c) XRD graphs of the FTO substrate, Sb:SnO₂ NBs, and undoped-SnO₂ NWs.

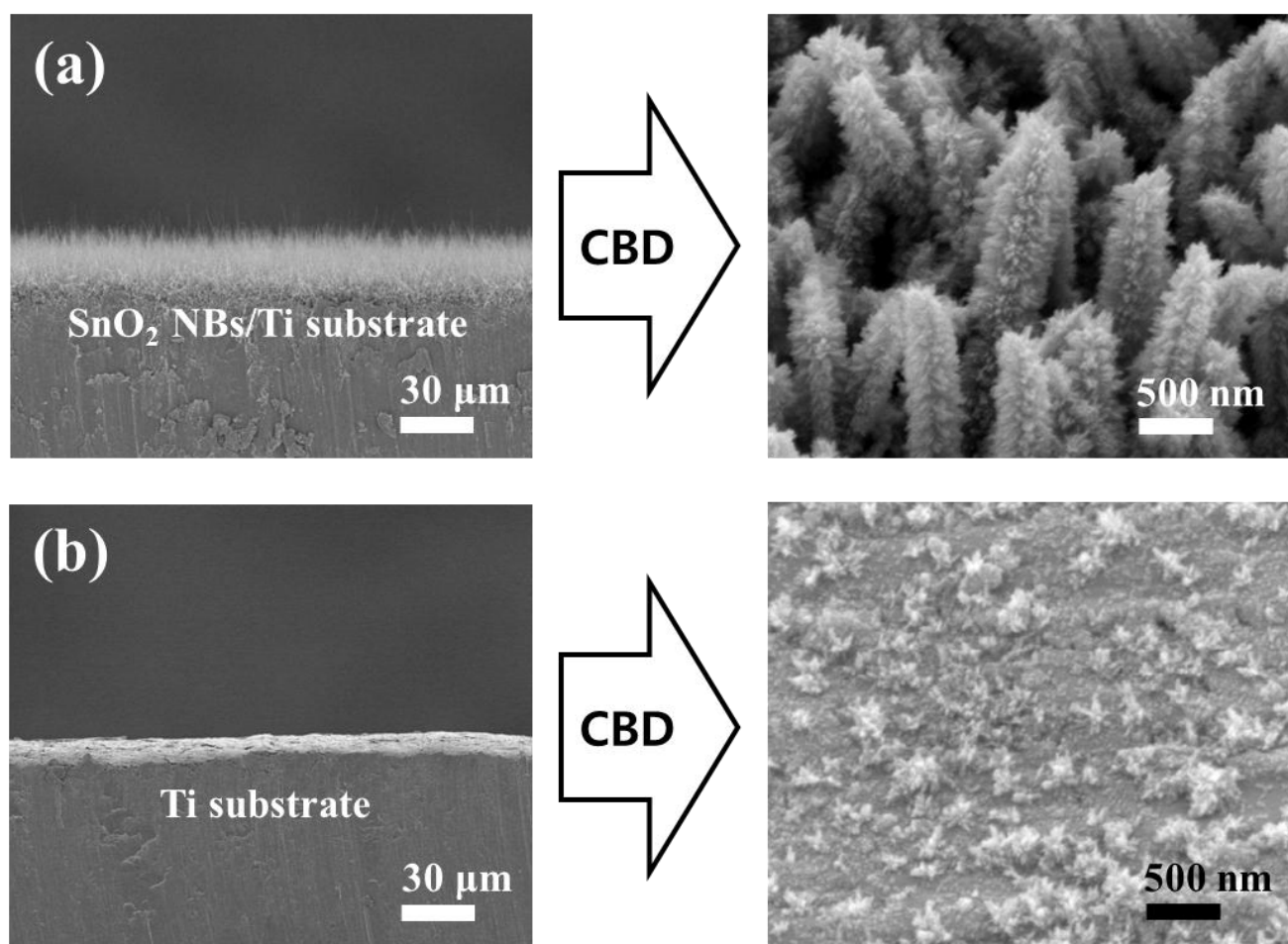


Fig. S2. SEM images of TiO₂ NRs in CBD (a) with and (b) without the SnO₂ NBs substrates.

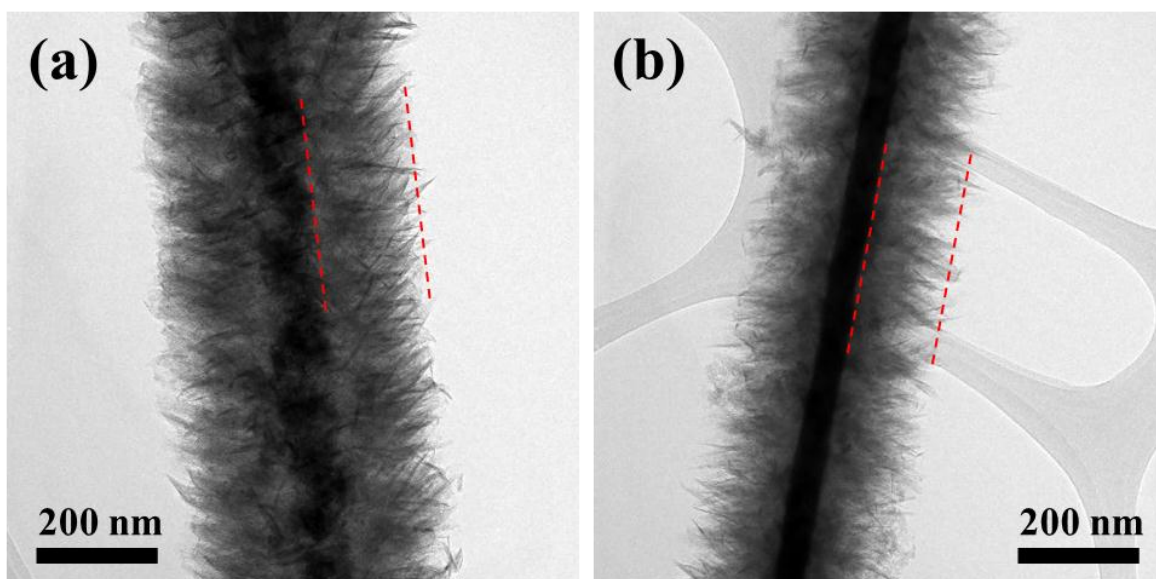


Fig. S3. TEM images of TiO₂ nanobranched structures synthesized by CBD with the addition of (a) HNO₃ and (b) HCl

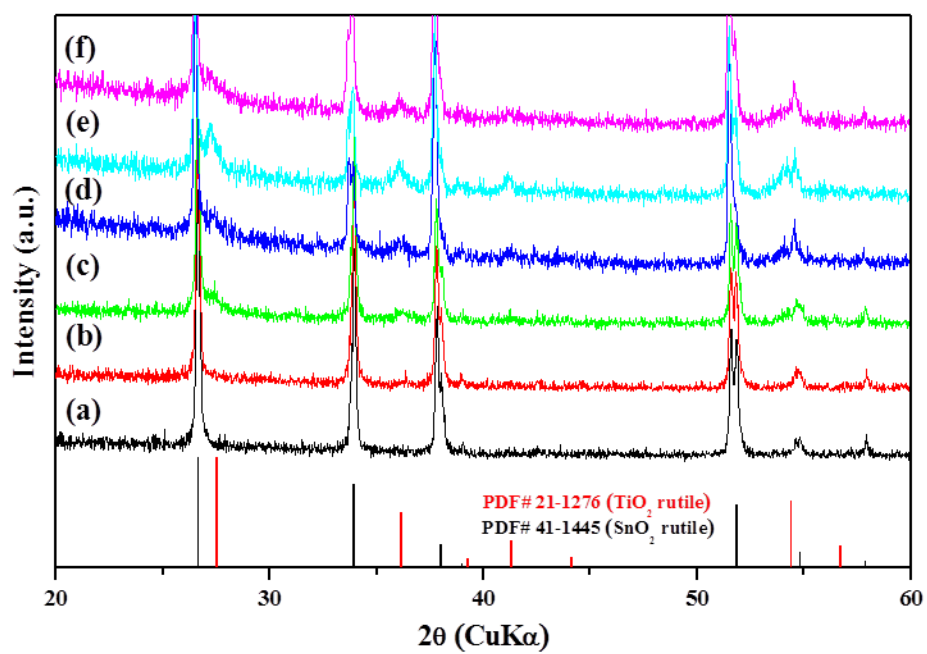


Fig. S4. XRD graphs of nanobranches synthesized in the presence of HNO₃ at different concentrations: (a) 0.02 M, (b) 0.06 M, (c) 0.1 M, (d) 0.2 M, (e) 0.3 M, and (f) 0.6 M.

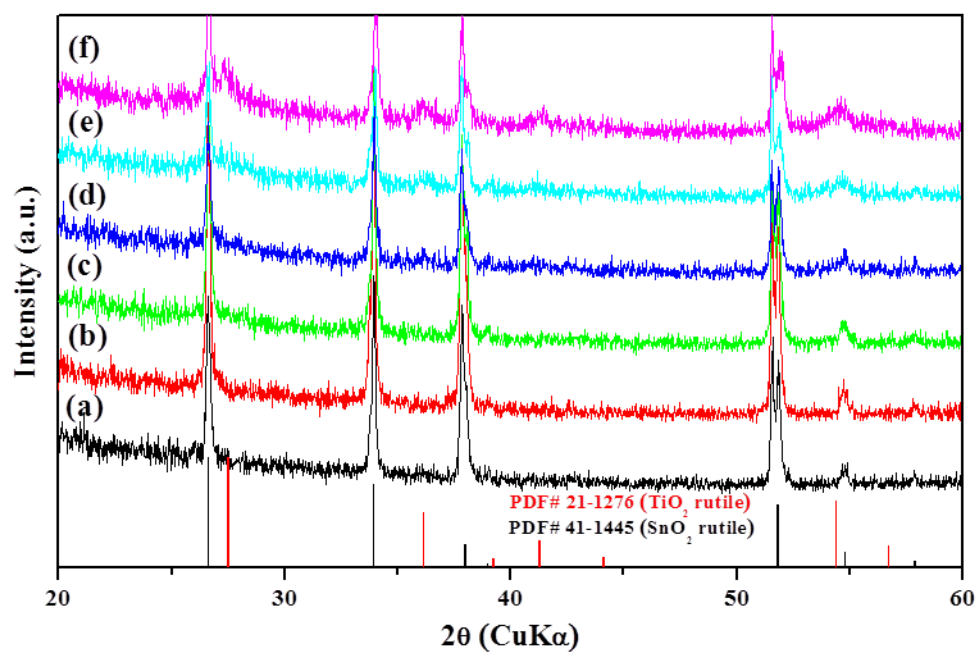


Fig. S5. XRD graphs of nanobranches synthesized in the presence of 0.2 M HNO_3 along the reaction time: (a) 0.5 h, (b) 1 h, (c) 1.5 h, (d) 2 h, (e) 2.5 h, and (f) 3 h.

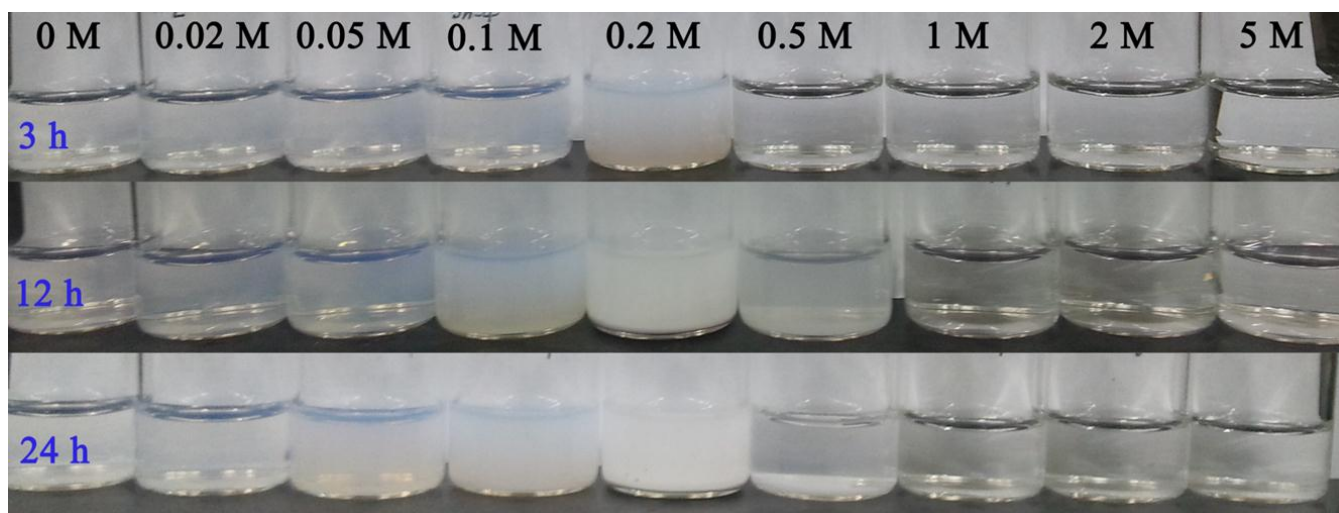


Fig. S6. Photographs of the TiCl₄ solution under various concentration of HNO₃ and reaction duration.

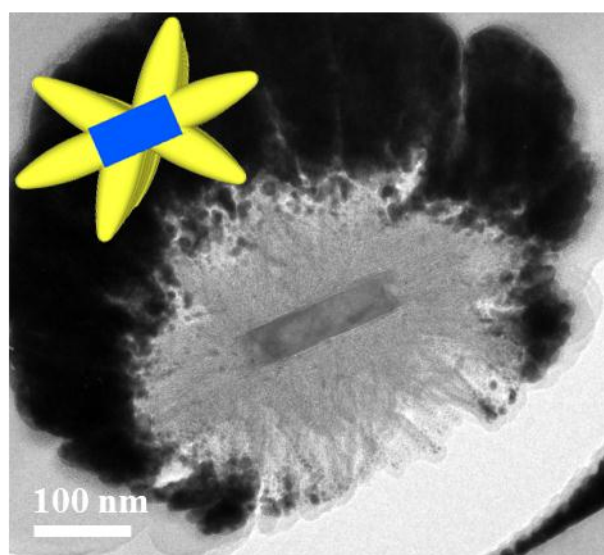


Fig. S7. A cross-sectional TEM image of a TiO₂-SnO₂.

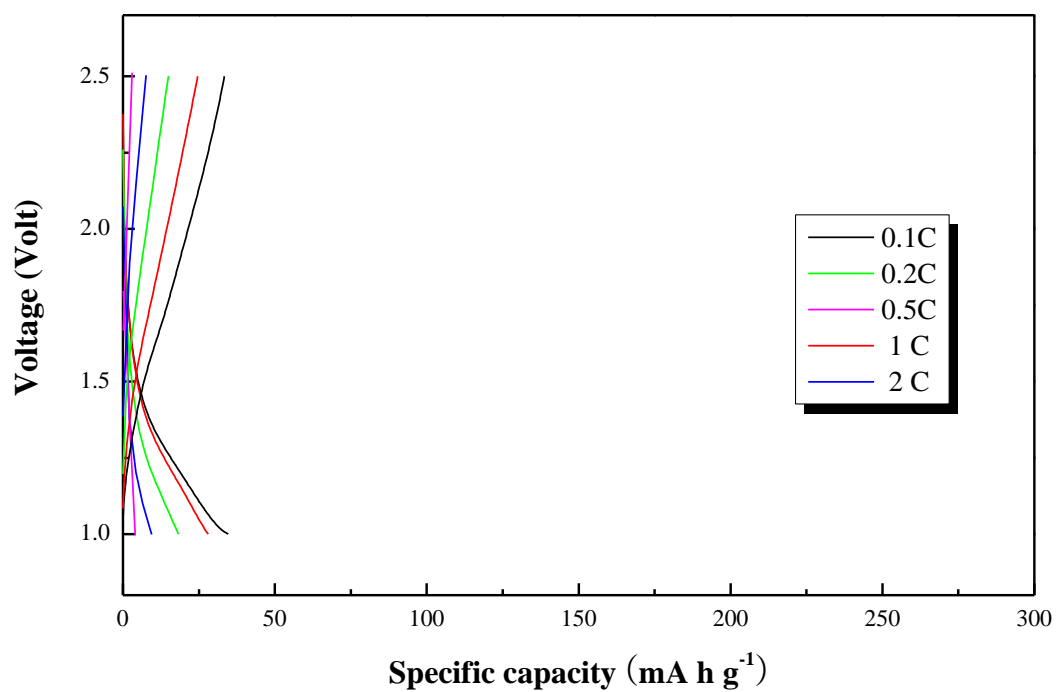


Fig. S8. Charging-discharging curves of the SnO₂ NBs electrode over 1.0 – 2.5 V.

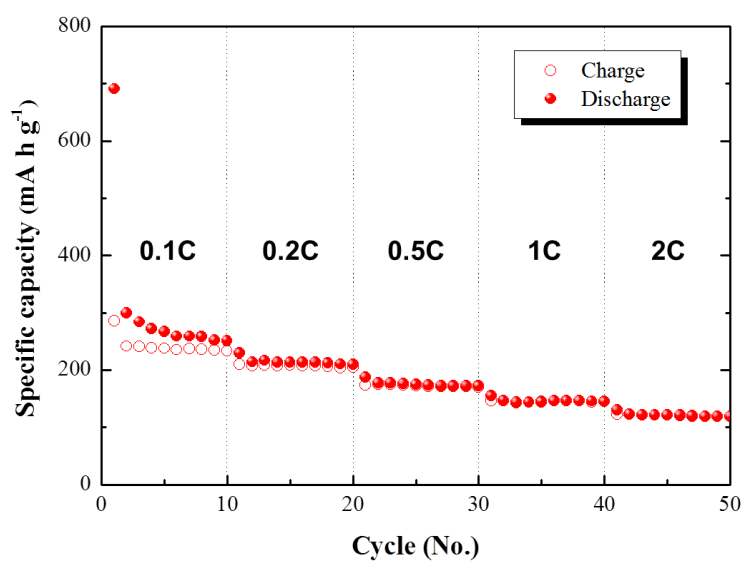


Fig. S9. Specific capacity versus cycle number of the TiO₂-SnO₂ electrode cycled ten times at every C-rate (0.1 C, 0.2 C, 0.5 C, 1 C, and 2 C).

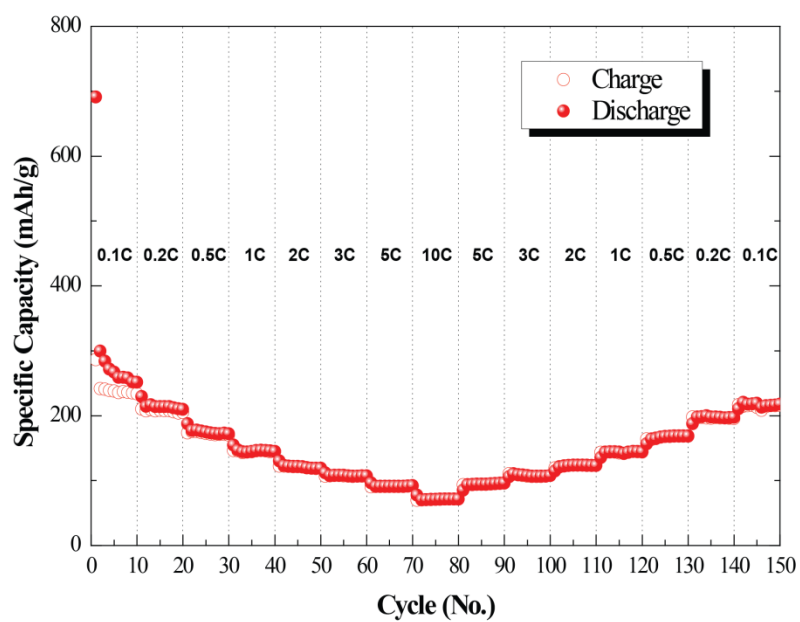


Fig. S10. Specific capacity versus cycle number of the TiO₂-SnO₂ electrode cycled ten times at every C-rate (0.1 C, 0.2 C, 0.5 C, 1 C, 2 C, 3 C, 6 C, and 10 C) over 1.0–2.5 V.