

Supplementary information

Properties of Disorder-Engineered Black Titanium Dioxide Nanoparticles through Hydrogenation

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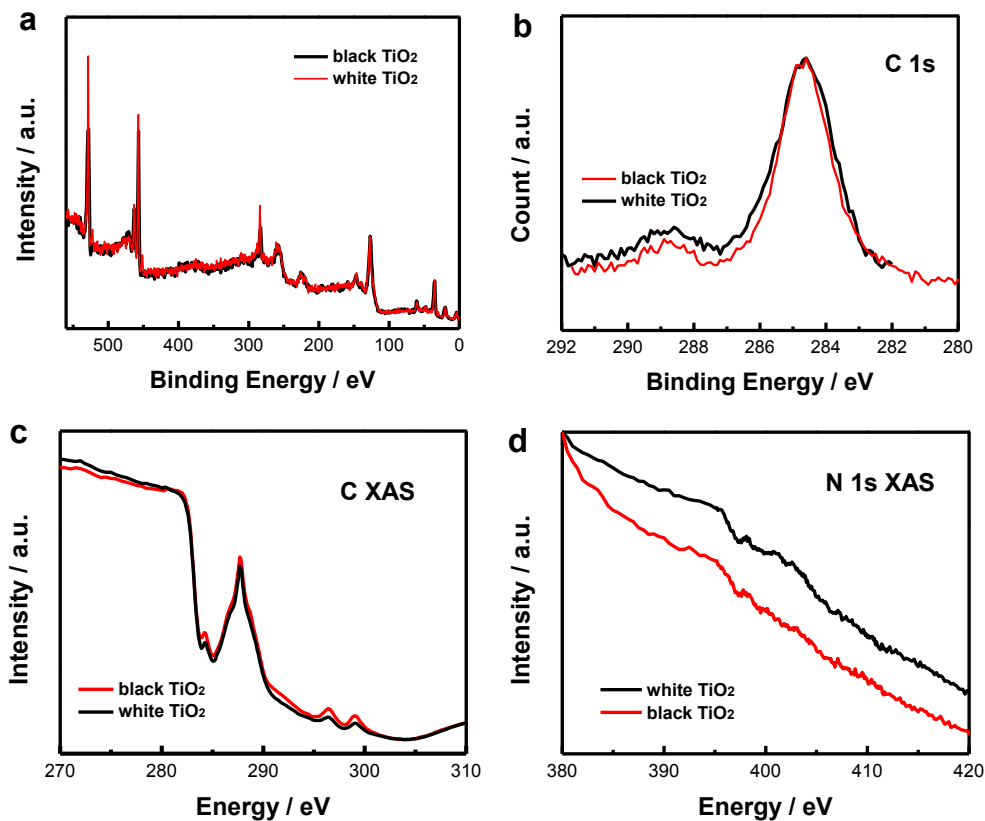
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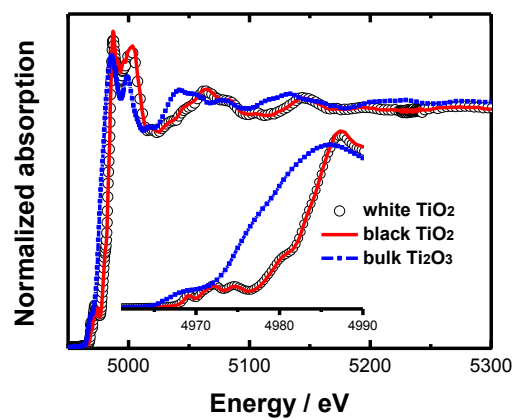
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Supplementary Information contains:

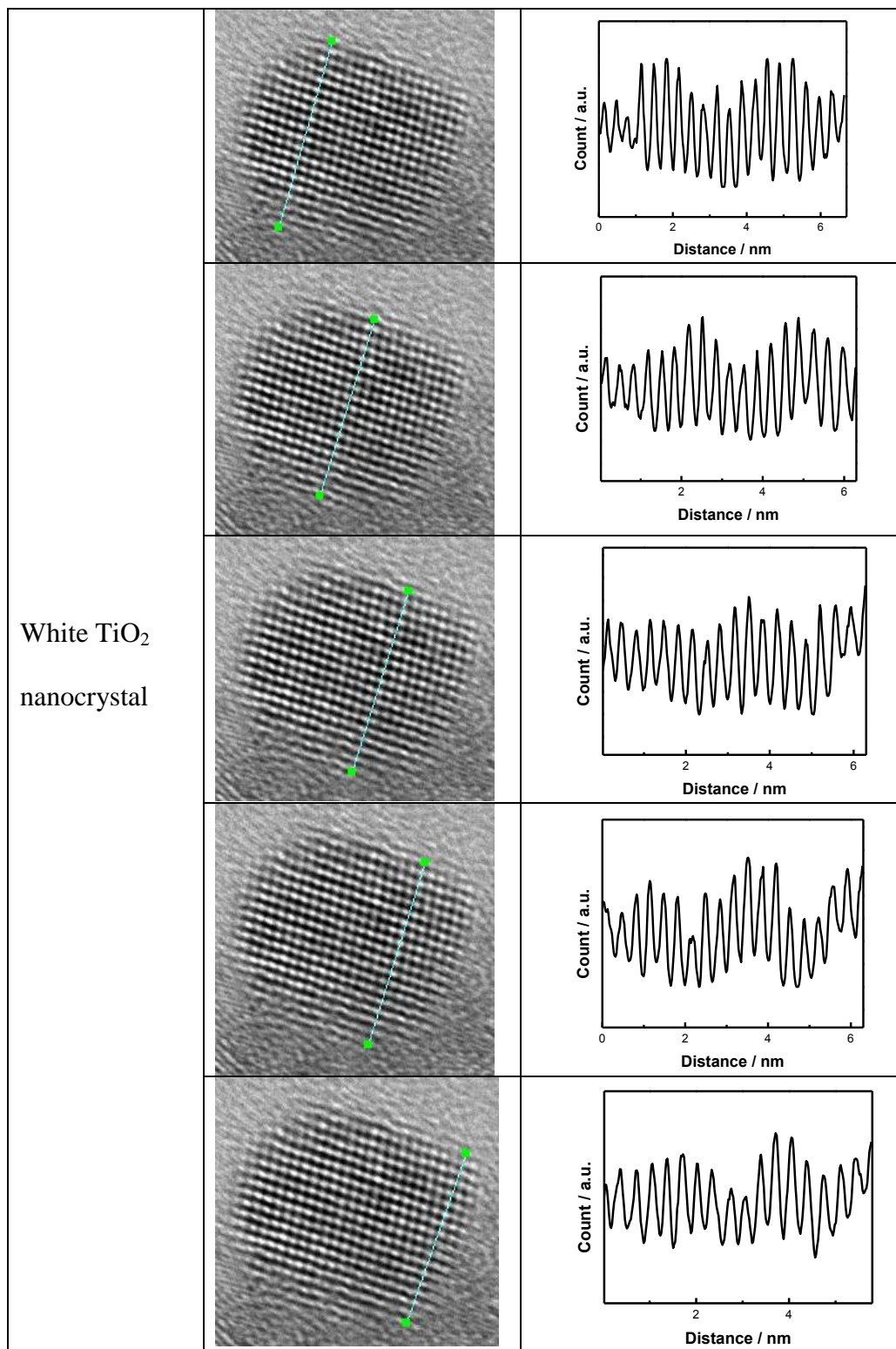
Supplementary Figures S1-S4



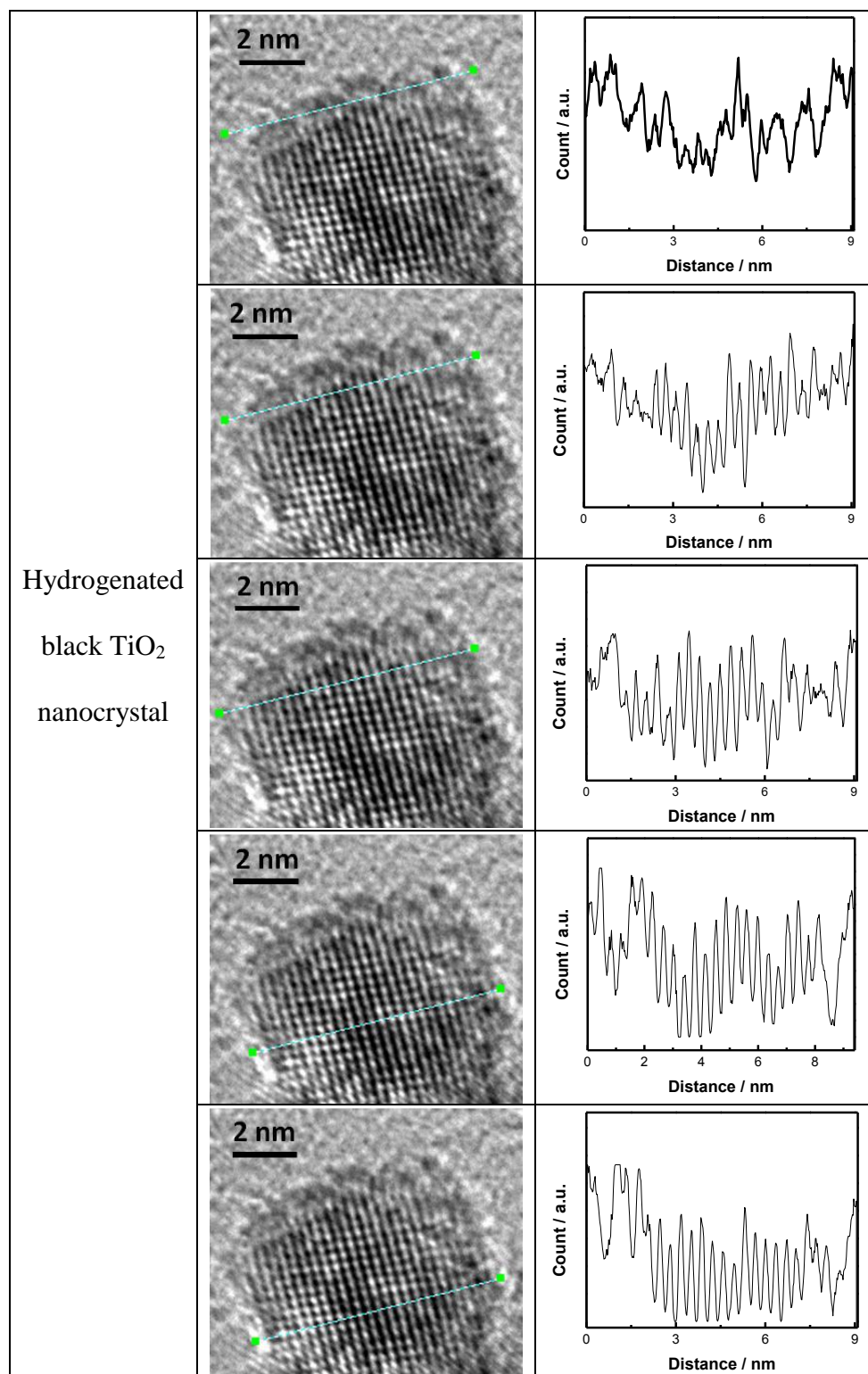
Supplementary Figure S1. XPS spectra of bare white and hydrogenated black TiO₂ nanocrystals. a, Survey XPS spectra. **b**, C 1s XPS spectra. Synchrotron XAS profiles of bare white and hydrogenated black TiO₂ nanocrystals (note that the intensity of dips originating from contaminated optics is only a few percent of total intensity). **c**, C K-edge XAS profiles, and **d**, N K-edge XAS profiles.



Supplementary Figure S2. XANES comparison between hydrogenated black and bare white TiO₂ along with the Ti³⁺ reference: Ti₂O₃.



Supplementary Figure S3. Lattice structural analysis of HRTEM images of white TiO₂ nanocrystals. The horizontal axes in the right panel from 0 to 6 nm correspond to the left and right ends of the lines in the left panel.



Supplementary Figure S4. Lattice structural analysis of HRTEM images of black TiO₂ nanocrystals. The horizontal axes in the right panel from 0 to 9 nm correspond to the left and right ends of the lines in the left panel.