

Supporting Information

One-Dimensional Piezoelectric BaTiO₃ Polycrystal of Topochemical Mesocrystal Conversion from Layered H₂Ti₄O₉·H₂O Single Crystal

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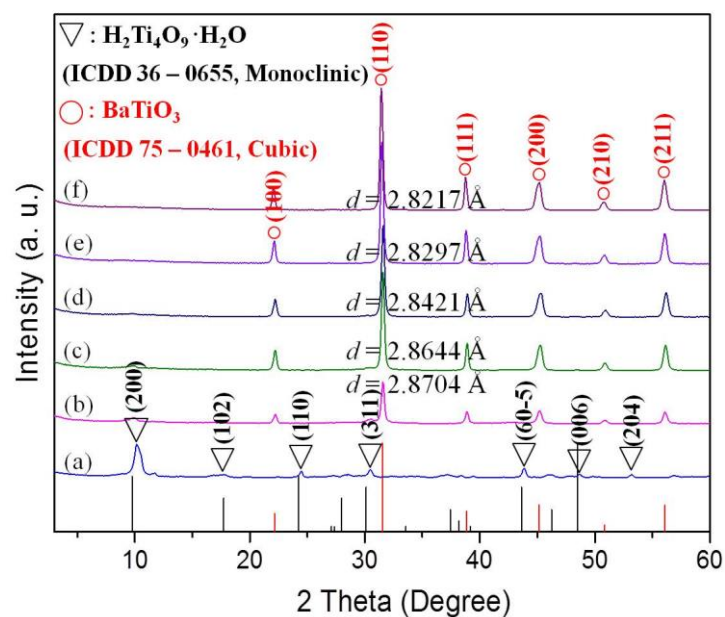


Figure S1 XRD patterns of $\text{H}_2\text{Ti}_4\text{O}_9 \cdot \text{H}_2\text{O}$ (HTO) single crystals (a) before and after hydrothermal treatments in $0.2 \text{ mol} \cdot \text{L}^{-1} \text{Ba}(\text{OH})_2$ water solution at 150°C for (b) 0.5, (c) 1, (d) 2, (e) 6, and (f) 12 h, respectively.

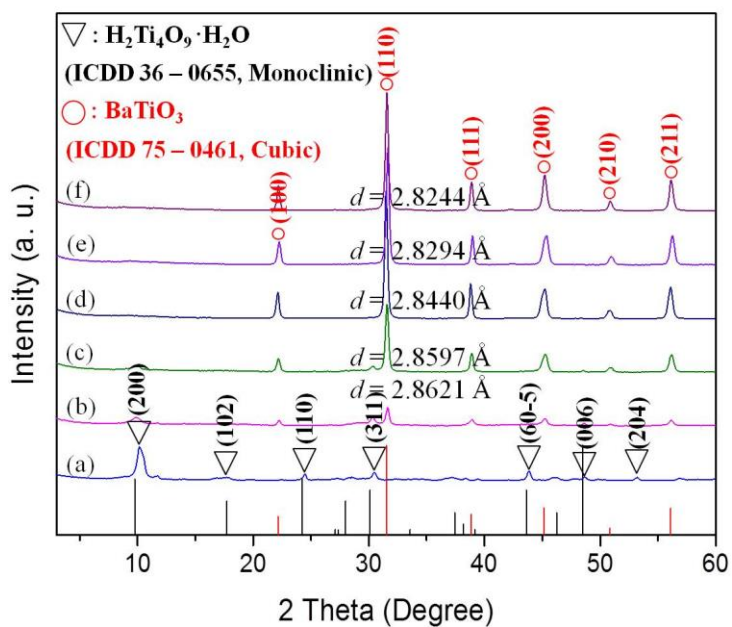


Figure S2 XRD patterns of HTO single crystals (a) before and after hydrothermal treatments in $0.1 \text{ mol} \cdot \text{L}^{-1} \text{Ba}(\text{OH})_2$ solution at 150°C for (b) 0.5, (c) 1, (d) 2, (e) 6, and (f) 12 h, respectively.

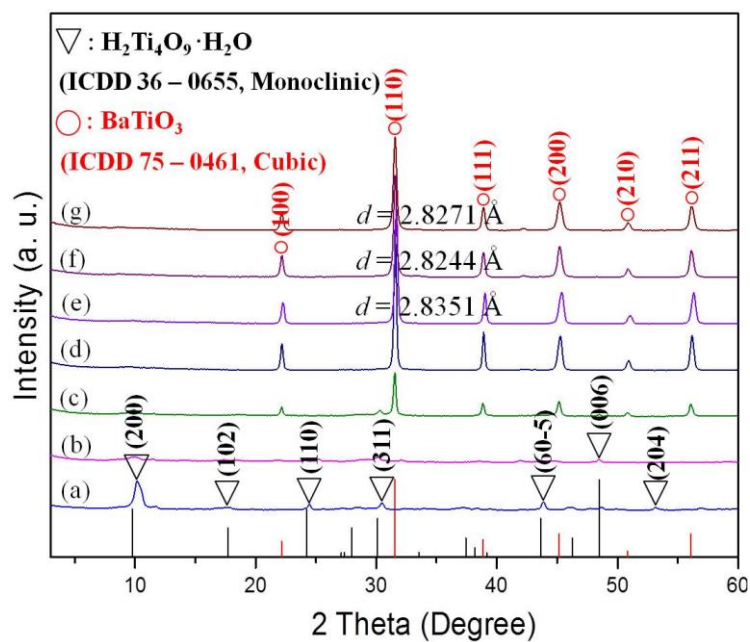


Figure S3 XRD patterns of HTO single crystals (a) before and after hydrothermal treatments in 0.1 mol · L⁻¹ Ba(OH)₂ water solution at (b) 50, (c) 80, (d) 100, (e) 120, (f) 150, and (g) 200 °C for 12 h, respectively.

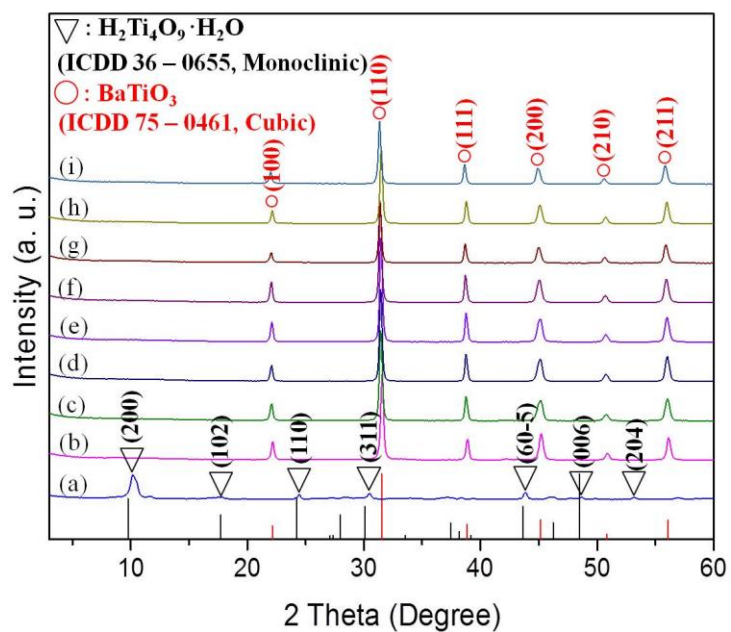


Figure S4 XRD patterns of HTO single crystals (a) before and after hydrothermal treatments in (b) 0.1, (c) 0.2, (d) 0.5, (e) 1.0, (f) 1.5, and (g) 2.0 mol · L⁻¹ Ba(OH)₂ water solution at 150 °C for 12 h, respectively.

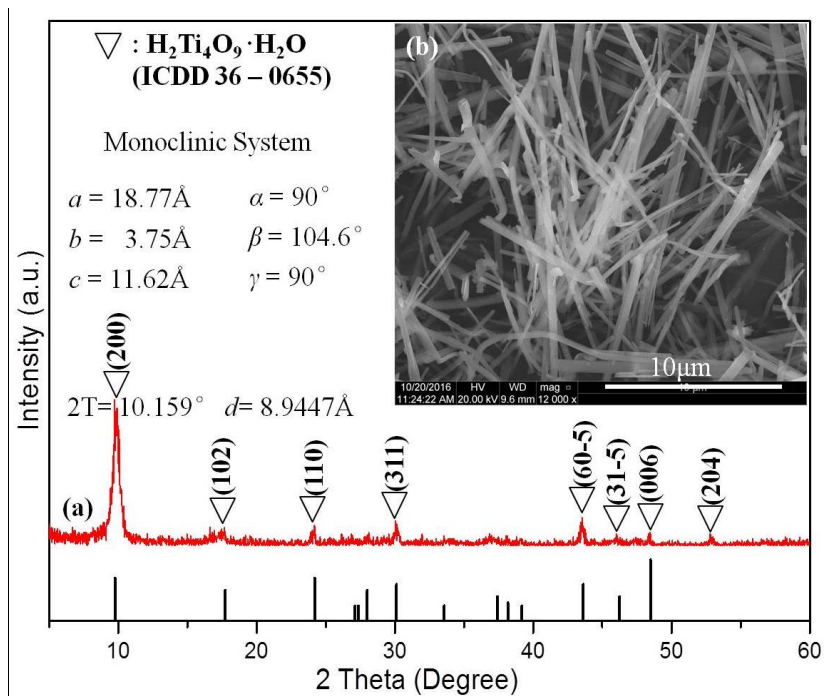


Figure S5 (a) XRD pattern and (b) SEM image of protonated HTO single crystals.

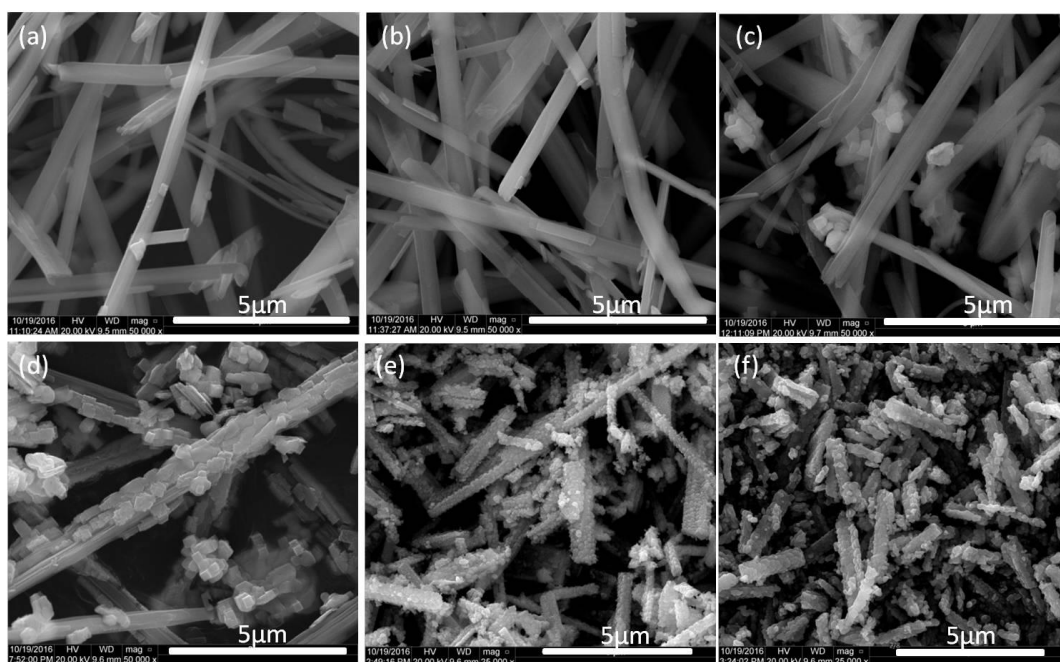


Figure S6 SEM images of samples obtained by hydrothermal treatments of HTO single crystals in $0.1 \text{ mol} \cdot \text{L}^{-1} \text{ Ba(OH)}_2$ water solution at (a) 50, (b) 80, (c) 100, (d) 120, (e) 150, and (f) 200 $^\circ\text{C}$ for 12 h, respectively.

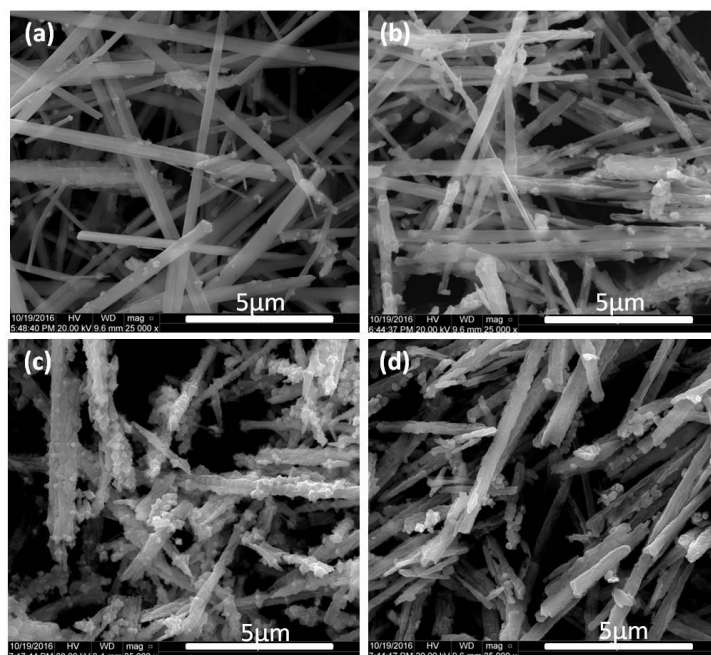


Figure S7 SEM images of samples obtained by hydrothermal treatments of HTO single crystals in $0.1 \text{ mol} \cdot \text{L}^{-1} \text{ Ba(OH)}_2$ water solution at $150 \text{ }^{\circ}\text{C}$ for (a) 0.5, (b) 1, (c) 2, and (d) 6 h, respectively.

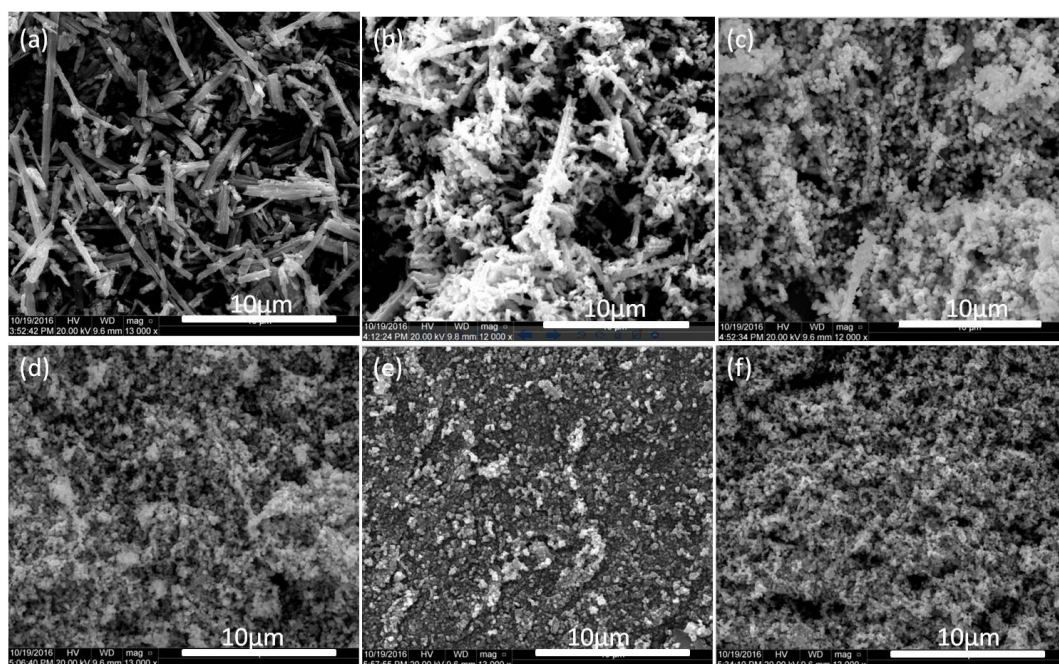


Figure S8 FE-SEM images of samples obtained by hydrothermal treatments of HTO single crystals in (a) 0.1, (b) 0.2, (c) 0.5, (d) 1.0, (e) 1.5, and (f) $2.0 \text{ mol} \cdot \text{L}^{-1} \text{ Ba(OH)}_2$ water solution at $150 \text{ }^{\circ}\text{C}$ for 12 h, respectively.

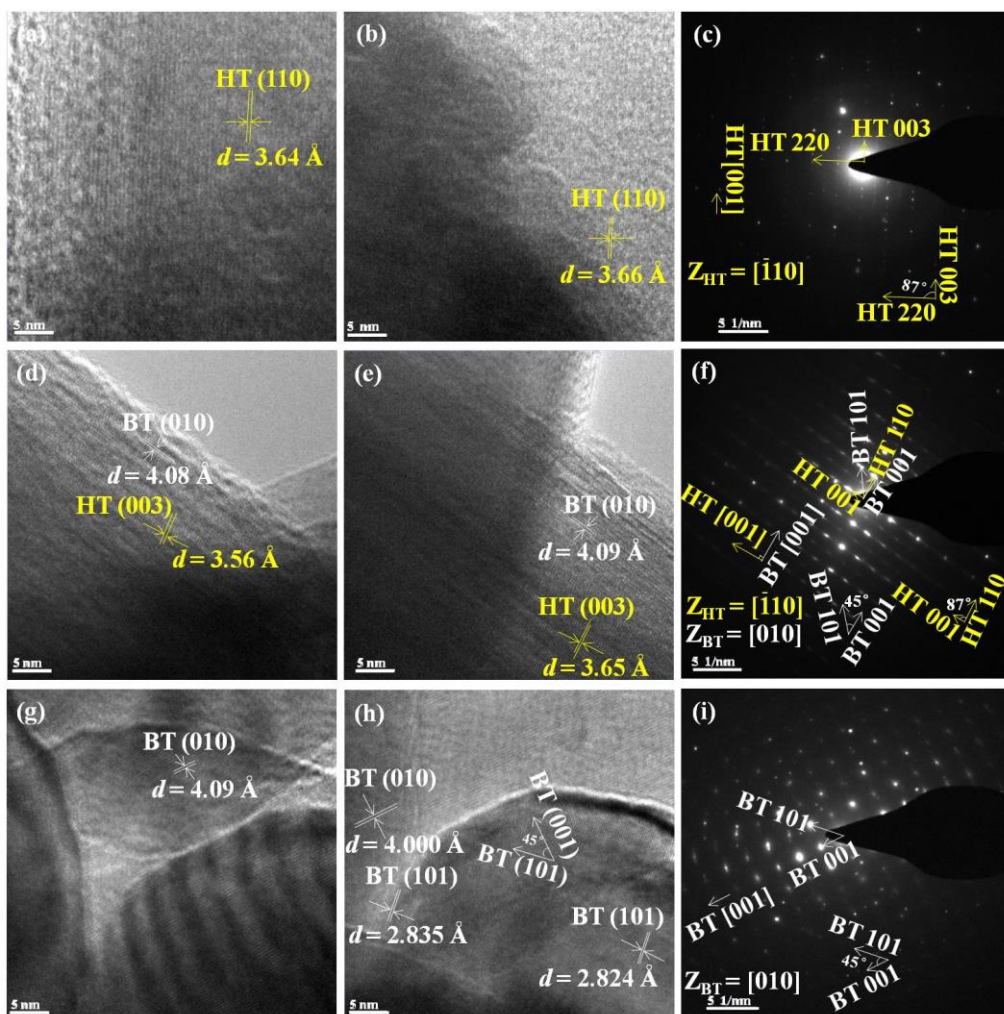


Figure S9 (a, b, d, e, g, h) HRTEM images, (c, f, i) SAED patterns of hydrothermal treatments of HTO single crystals in $0.1 \text{ mol} \cdot \text{L}^{-1} \text{ Ba(OH)}_2$ water solution at (a-c) 80, (d-f) 100, and (g-i) 150 °C for 12 h, respectively.