

**Supporting information for:**

**Water-soluble CaO sacrificial layer heteroepitaxially grown on yttria-stabilized zirconia substrate for large ferroelectric BaTiO<sub>3</sub> sheets**

Weikun Zhou<sup>1</sup>, Lizhikun Gong<sup>2</sup>, Ren Mitsuya<sup>1</sup>, Diwen Chen<sup>1</sup>, Hiromichi Ohta<sup>3</sup> and Tsukasa Katayama<sup>3,4\*</sup>

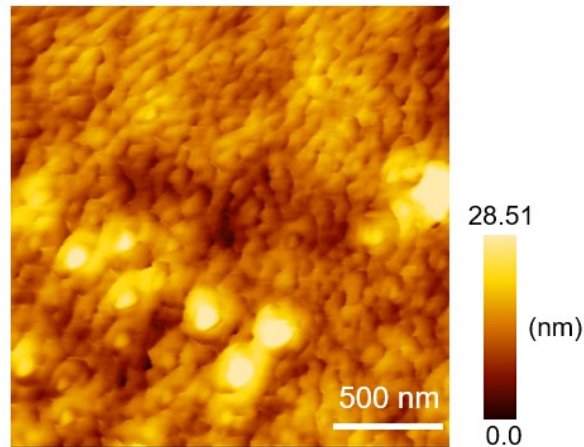
<sup>1</sup>Graduate School of Information Science and Technology, Hokkaido University, N14W9, Kita, Sapporo 060-0814, Japan

<sup>2</sup>Key Laboratory of Artificial Micro- and Nano-structures of Ministry of Education and School of Physics and Technology, Wuhan University, Wuhan, China

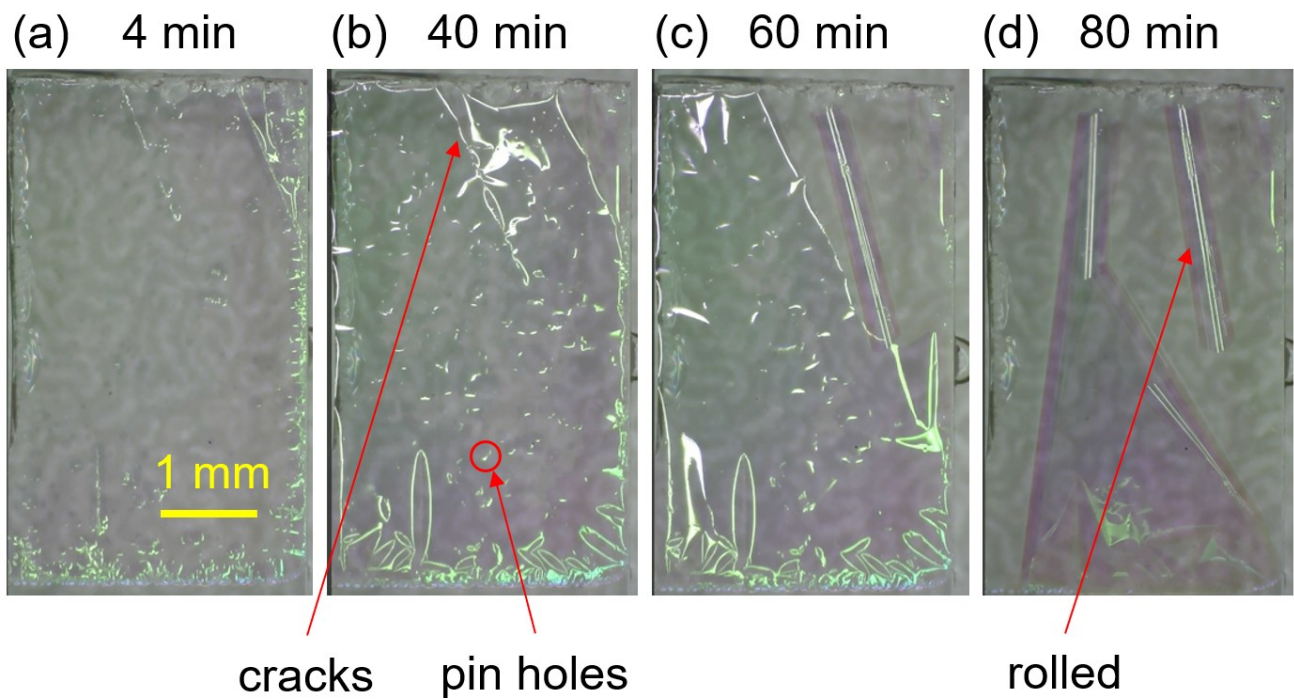
<sup>3</sup>Research Institute for Electronic Science, Hokkaido University, N20W10, Kita, Sapporo 001-0020, Japan

<sup>4</sup>JST-PRESTO, Kawaguchi, Saitama 332-0012, Japan

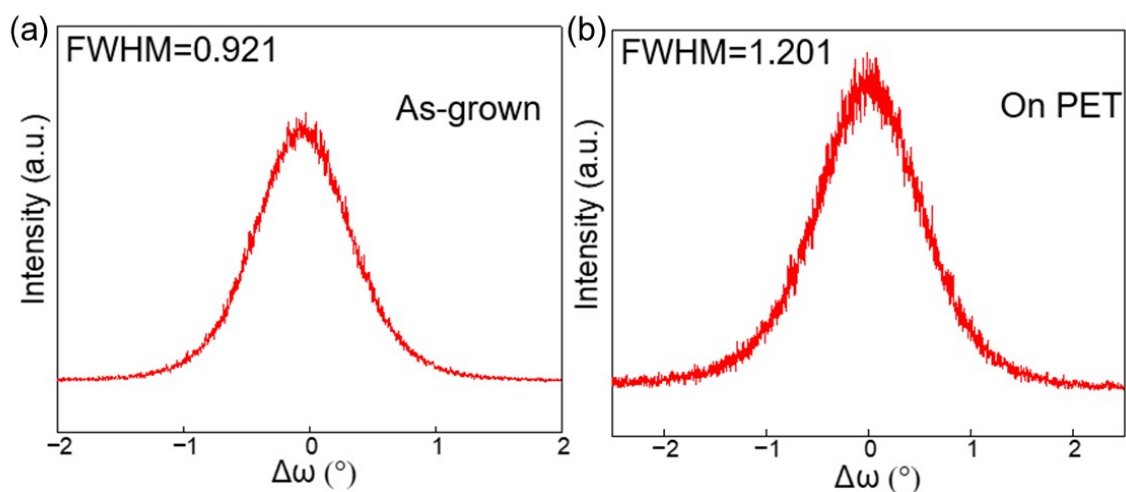
\*Corresponding author: [katayama@es.hokudai.ac.jp](mailto:katayama@es.hokudai.ac.jp)



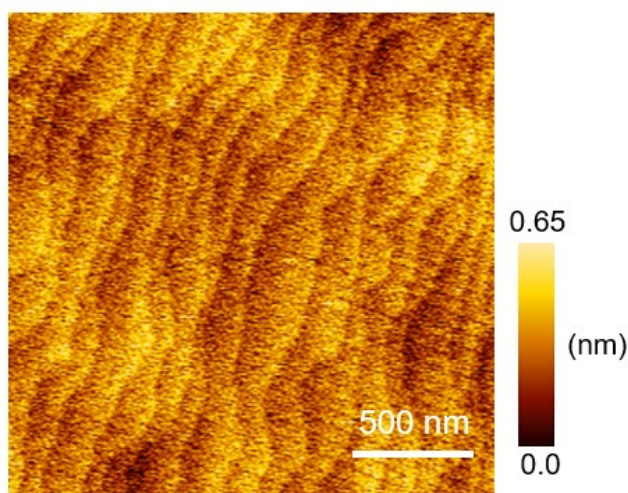
**Figure S1.** Atomic force microscopy image of the BTO sheet. Root mean square roughness is 4.4 nm



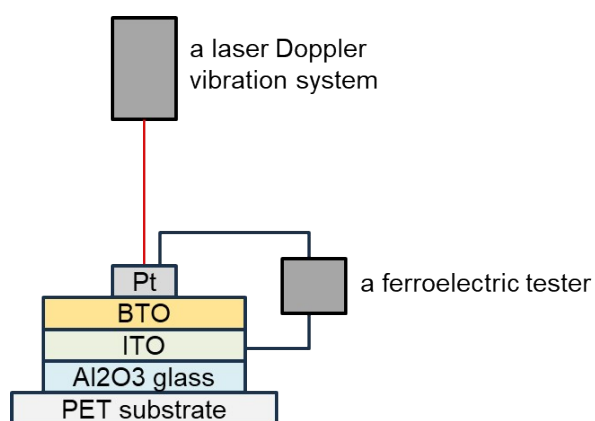
**Figure S2.** Photographs of the as-grown BTO/CaO film without  $\text{Al}_2\text{O}_3$  glass protection layer after being placed in pure water for (a) 4, (b) 40, (c) 60, and (d) 80 min.



**Figure S3.** Rocking curves of the 002 diffraction peaks of BTO for the (a) as-grown film and (b) sheet transferred on PET substrate.



**Figure S4.** Atomic force microscopy image of the new YSZ sheet. Root mean square roughness is 0.101 nm



**Figure S5.** A schematic image showing the electrode arrangement and the measurement setup for the piezoelectric measurements.