## Surface Engineered TiO<sub>2</sub> for high performance flexible supercapacitor applications

Abdelnaby M. Elshahawy<sup>1\*</sup>, Saeid M. Elkatlawy<sup>2</sup>, Mustafa S. Shalaby<sup>3</sup>, Cao Guan <sup>4</sup>, and John Wang<sup>5</sup>

<sup>1</sup> Physics Department, Faculty of Science, Assiut University, Assiut 71516, Egypt

<sup>2</sup> Department of Physics, Faculty of Science, Damanhour University, 22111 Damanhour, Egypt.

<sup>3</sup>Solid State Physics and Accelerators department, National Center for Radiation Research and Technology, Egyptian Atomic Energy Authority, Cairo, Egypt

<sup>4</sup>Frontiers Science Center for Flexible Electronics, Institute of Flexible Electronics, Northwestern Polytechnical University, Xi'an 710072, P. R. China

<sup>5</sup> Department of Materials Science and Engineering, National University of Singapore, 9 Engineering Drive 1, Singapore 117575, Singapore.

\*Address correspondence to <u>a.elshahawy@science.aun.edu.eg</u>.



Figure S1: TEM images of (a)  $TiO_2$  with Tape Under N2, (b)  $TiO_2$  without Tape Under Air, (c)  $TiO_2$  with Tape under Air



**Figure S2**: (a) Cyclic Voltammetry Curves at different scan rate, and (b) Charge and Discharge curves at different current densities of TiO<sub>2</sub> with Tape under N2.



**Figure S3**: (a) Cyclic Voltammetry Curves at different scan rate, and (b) Charge and Discharge curves at different current densities of TiO<sub>2</sub> with Tape before annealing.



Figure S4: (a) Cyclic Voltammetry Curves at different scan rate, and (b) Charge and

Discharge curves at different current densities of TiO2 without Tape under air.