

## Supporting information (SI)

---

### **Atomic Layer Deposited Coatings to Significantly Stabilize Anodes for Li ion Batteries: Effects of Coating Thickness via the Size of Anode Particles**

**Dongniu Wang,<sup>1,2</sup> Jinli Yang,<sup>1</sup> Jian Liu,<sup>1</sup> Xifei Li,<sup>1</sup> Ruying Li,<sup>1</sup> Mei Cai,<sup>3</sup>**

**Tsun-Kong Sham<sup>\*2</sup> and Xueliang Sun<sup>\*1</sup>**

*<sup>1</sup>Department of Mechanical and Materials Engineering, University of Western*

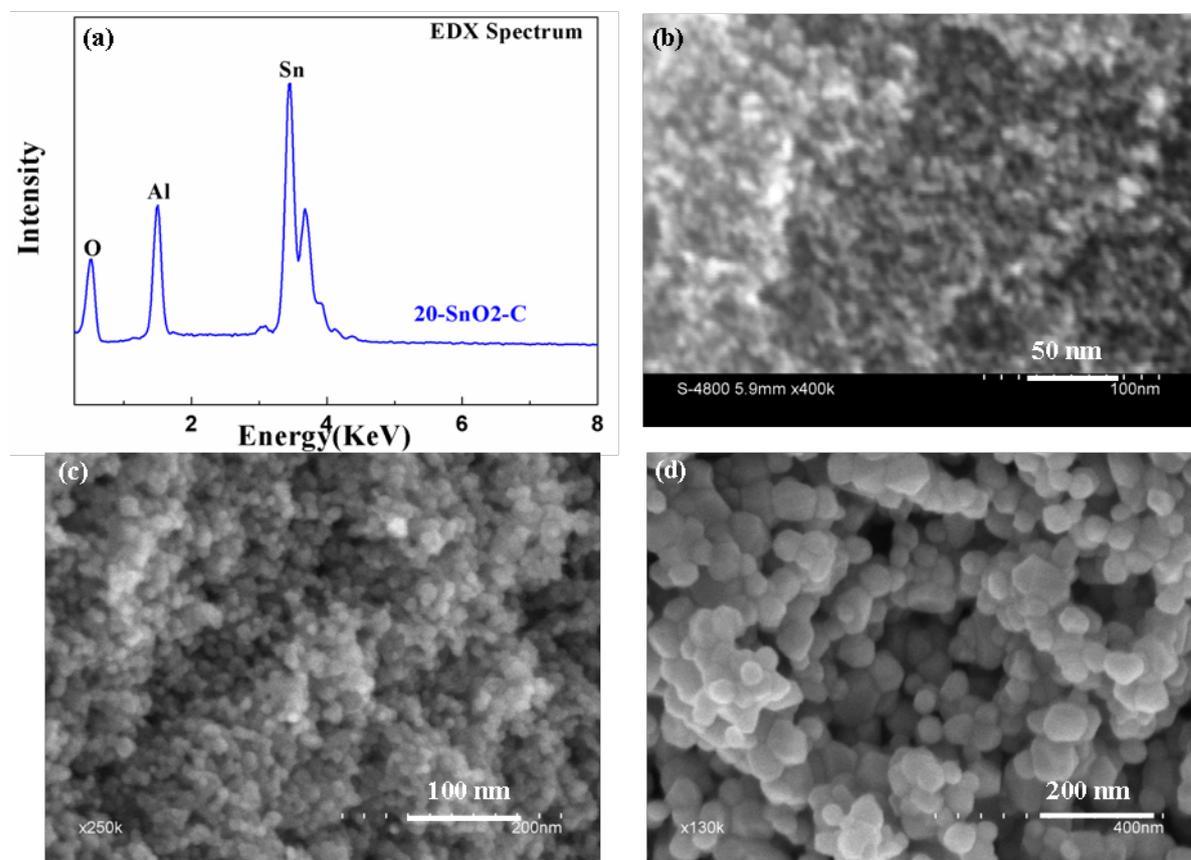
*Ontario, London, Ontario, N6A 5B9 Canada. Email: xsun@eng.uwo.ca; Tel: +1 519*

*661-2111 ext. 87759*

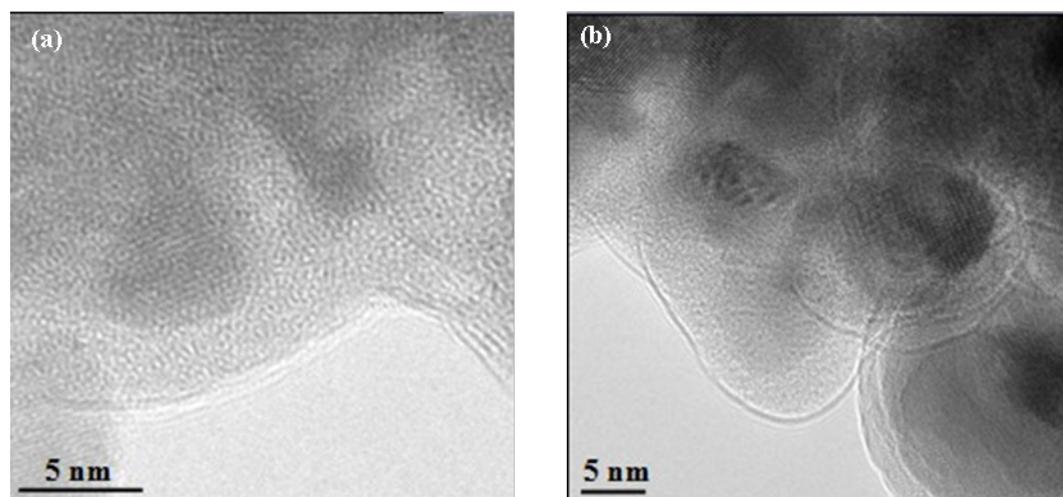
*<sup>2</sup>Department of Chemistry, University of Western Ontario, London, Ontario, N6A 5B7*

*Canada. Email: tsham@uwo.ca; Tel: +1 519 661-2111 ext. 86341*

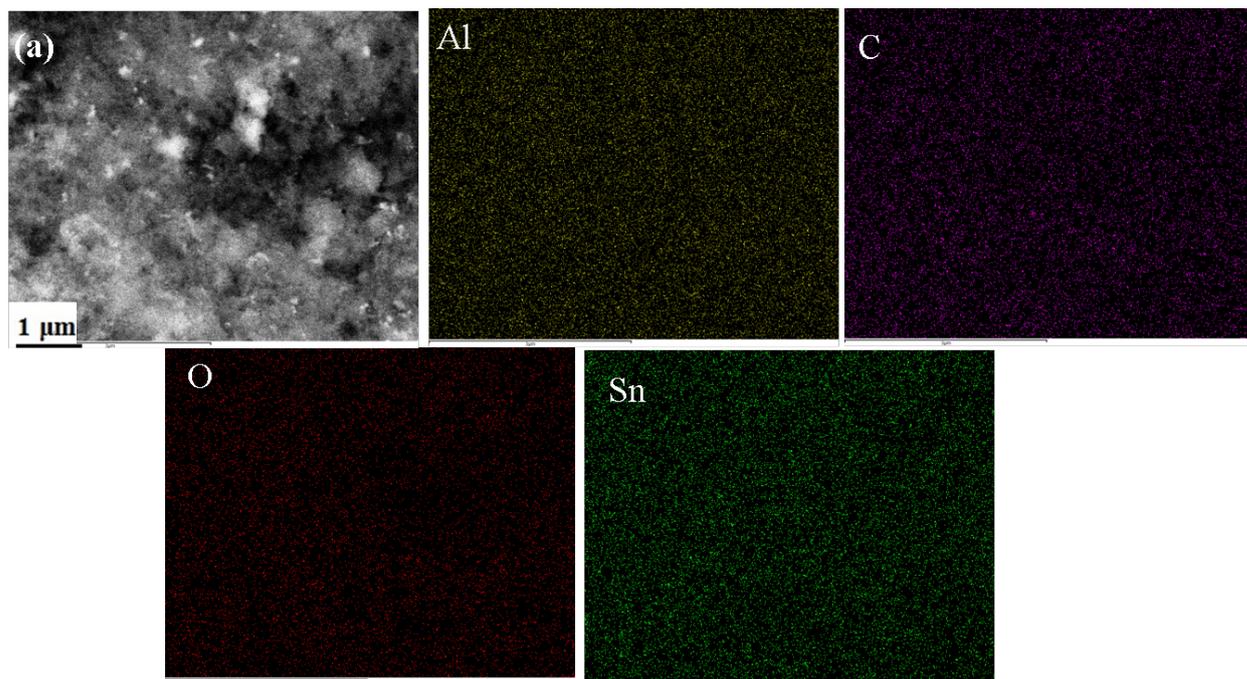
*<sup>3</sup>General Motors R&D Center, Warren, 48090-9055, MI, USA*



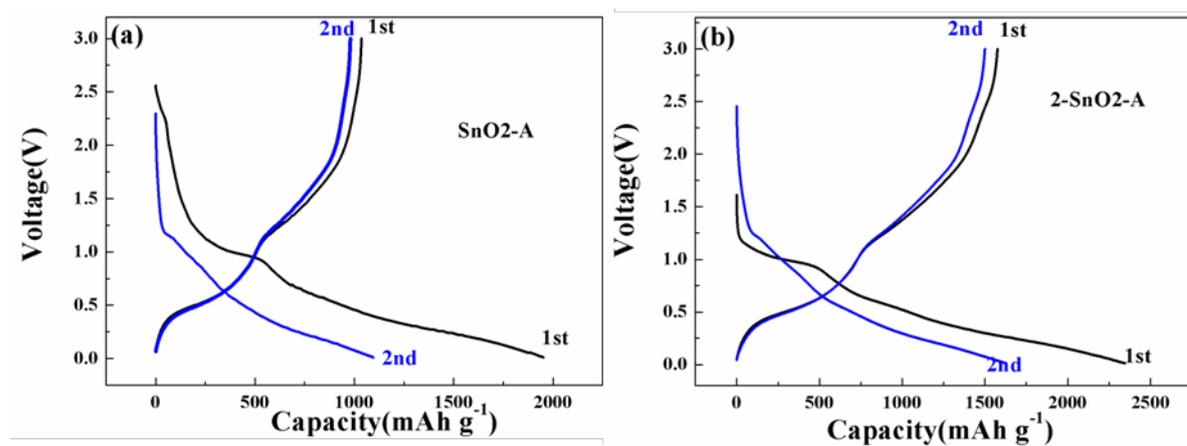
**Figure S1.** (a) EDX spectrum of 20-SnO<sub>2</sub>-C and SEM images of (b) SnO<sub>2</sub>-A, (c) SnO<sub>2</sub>-B and (d) SnO<sub>2</sub>-C.



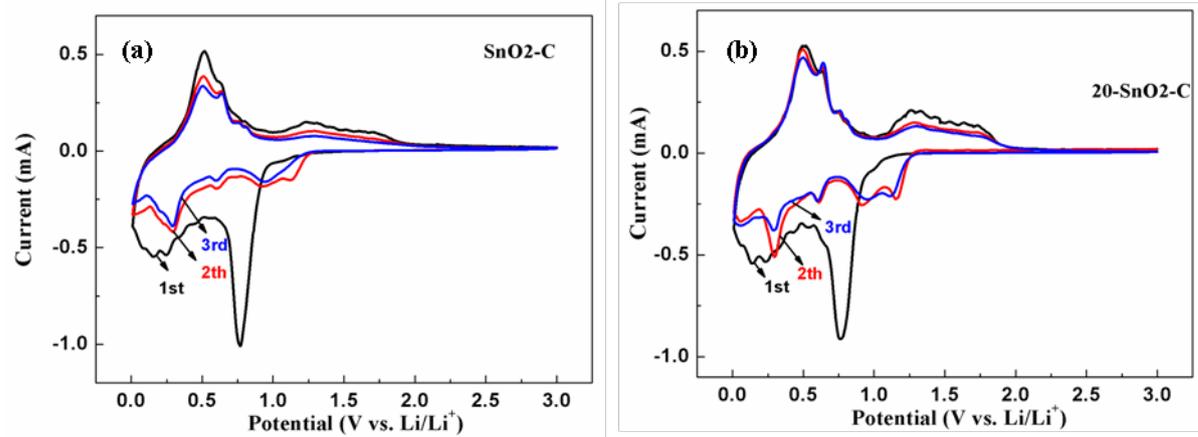
**Figure S2.** TEM images of (a) 20-SnO<sub>2</sub>-A and (b) 20-SnO<sub>2</sub>-B.



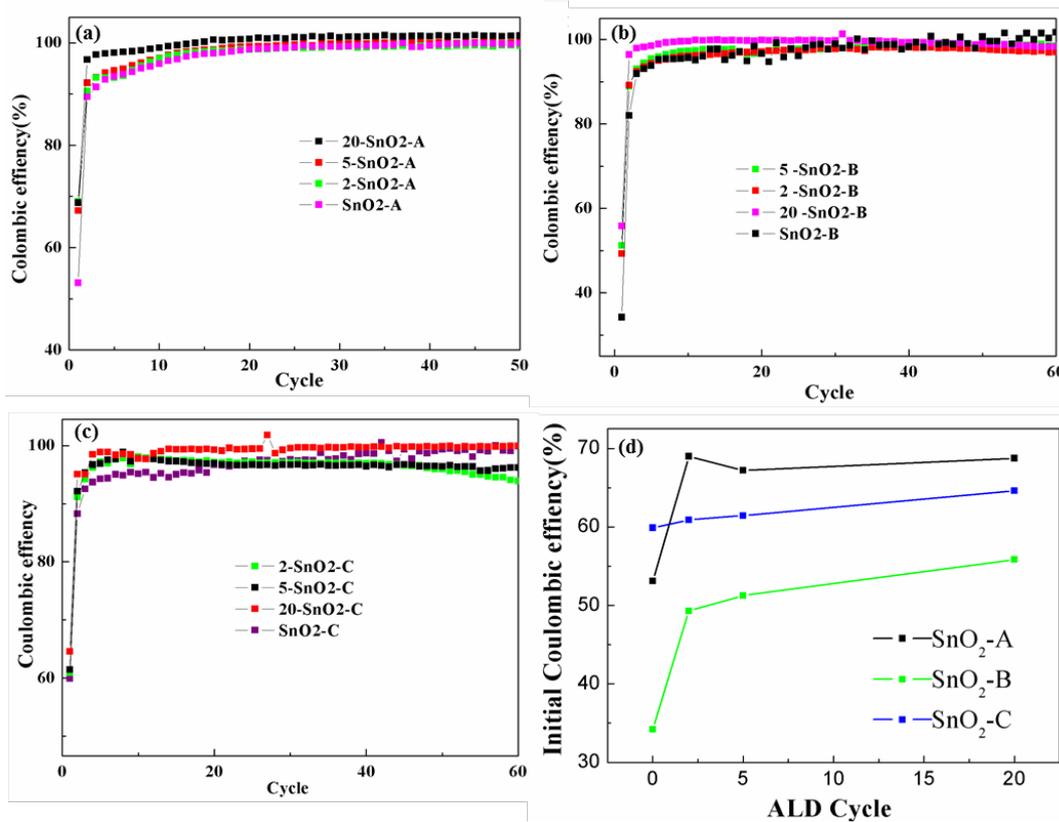
**Figure S3.** Elemental mapping spectra of 20-SnO<sub>2</sub>-A.



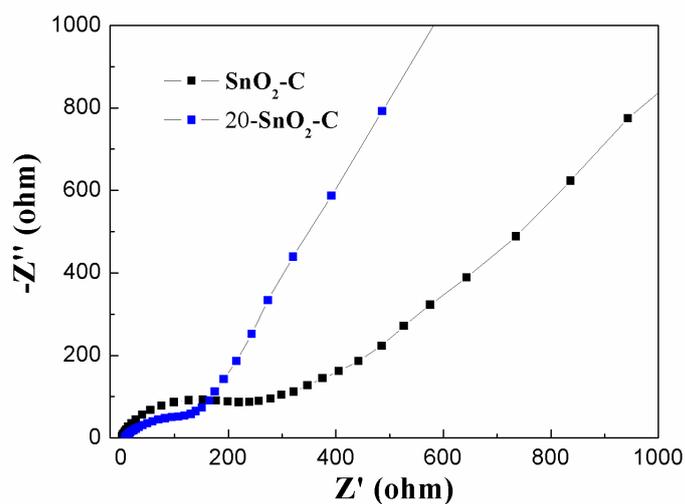
**Figure S4.** Charge-discharge profiles of (a) SnO<sub>2</sub>-A and (b) 2-SnO<sub>2</sub>-A electrodes



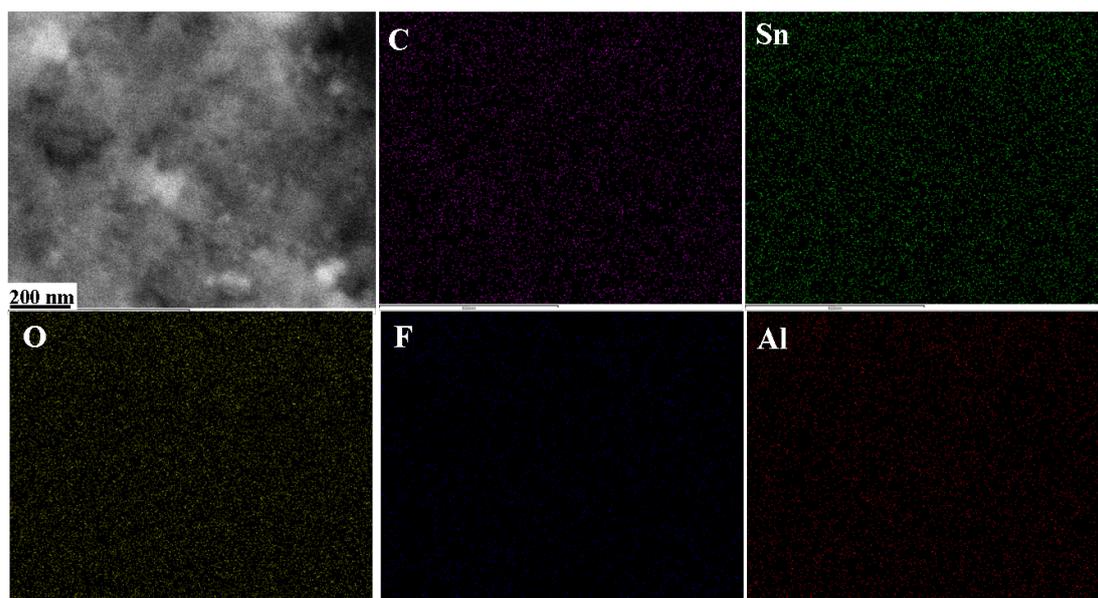
**Figure S5** Cyclic Voltammetry (CV) of (a) SnO<sub>2</sub>-C and (b) 20-SnO<sub>2</sub>-C electrodes



**Figure S6.** Coulombic efficiency of SnO<sub>2</sub> and ALD coated SnO<sub>2</sub>. (a) SnO<sub>2</sub>-A series; (b) SnO<sub>2</sub>-B series; (c) SnO<sub>2</sub>-C series; (d) Initial coulombic efficiency of coated and non-coated electrodes.



**Figure S7.** Nyquist plots of SnO<sub>2</sub>-C and 20-SnO<sub>2</sub>-C at 0.7 V in 10<sup>th</sup> cycle.



**Figure S8.** (a) Elemental mapping spectra of 20-SnO<sub>2</sub>-C after cycling.