

## Supporting Information

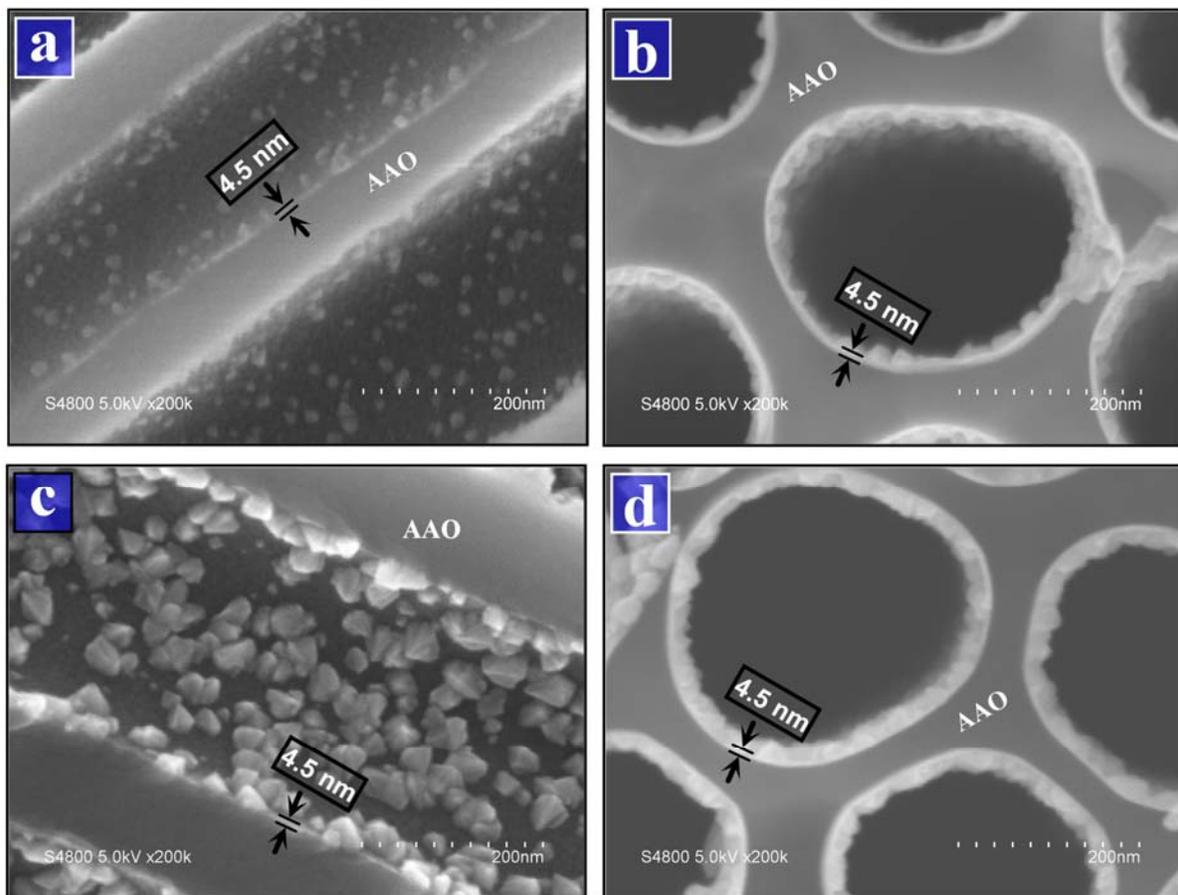
### Three Growth Modes and Mechanisms for Highly Structure-tunable SnO<sub>2</sub> Nanotube Arrays of Template-directed Atomic Layer Deposition

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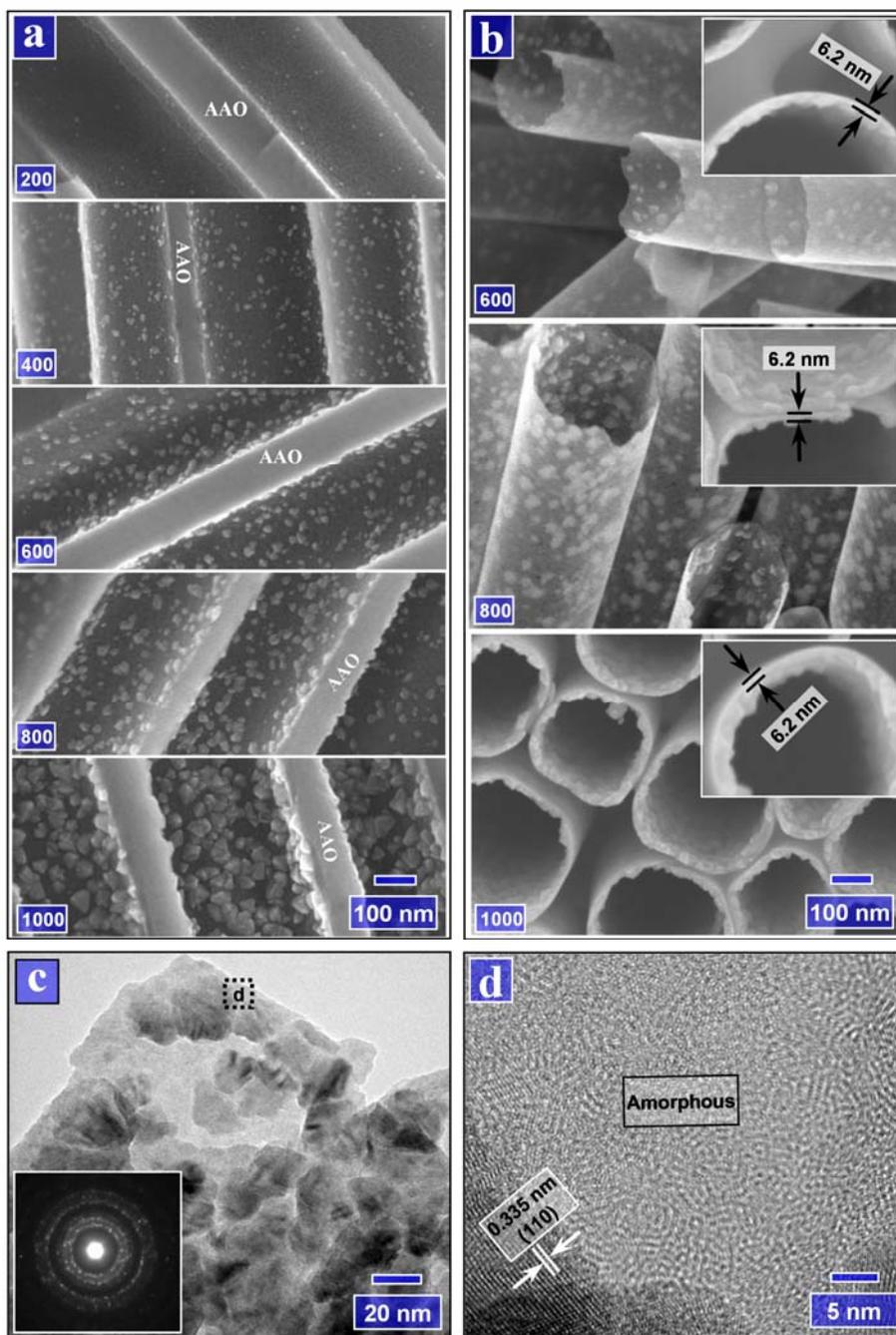
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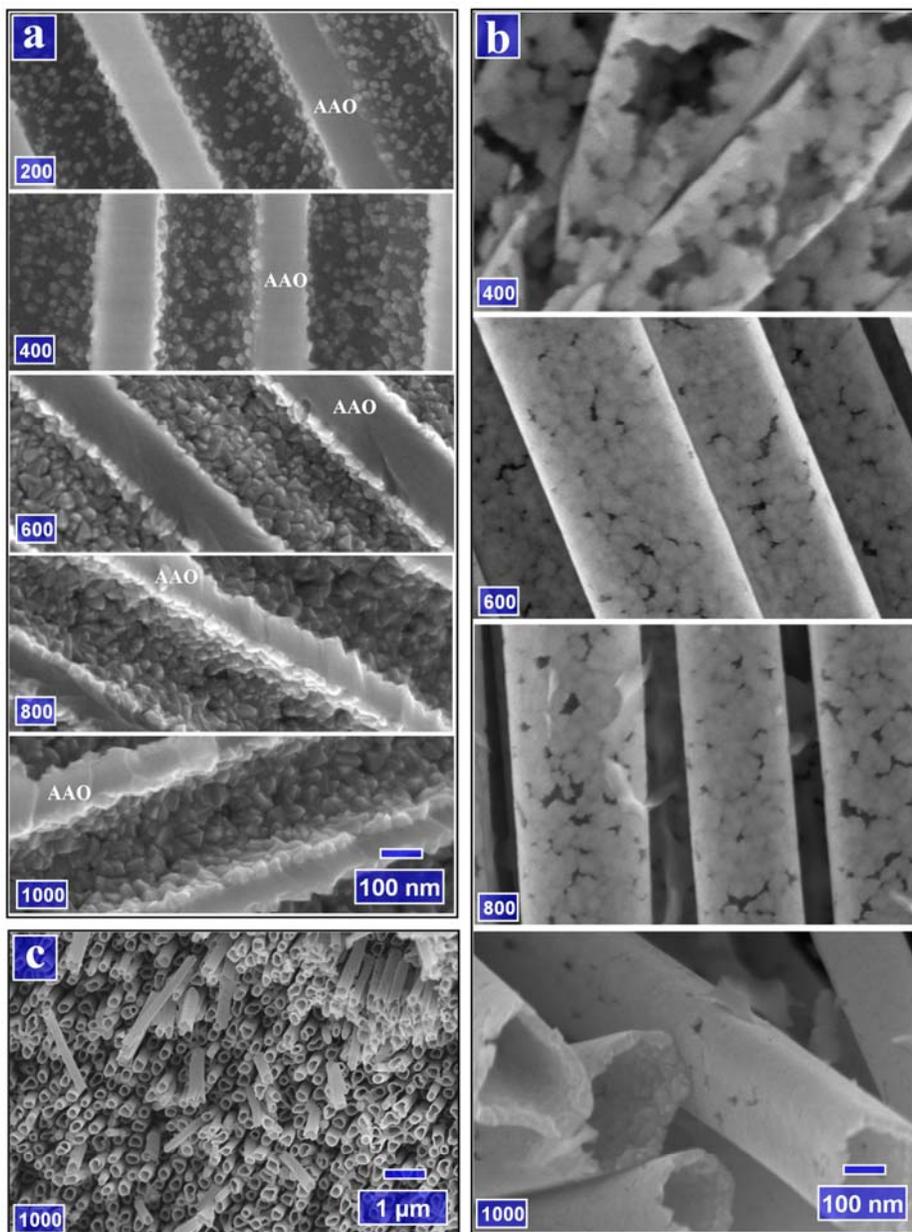
**Figure SI-1.**

Figure SI-1. ALD-SnO<sub>2</sub> at 300 °C. SEM images of side-views of AAO pores after (a) 200, and (c) 600 ALD-SnO<sub>2</sub> cycles; and SEM images of top-views of AAO pores after (b) 400, and (d) 600 ALD-SnO<sub>2</sub> cycles.



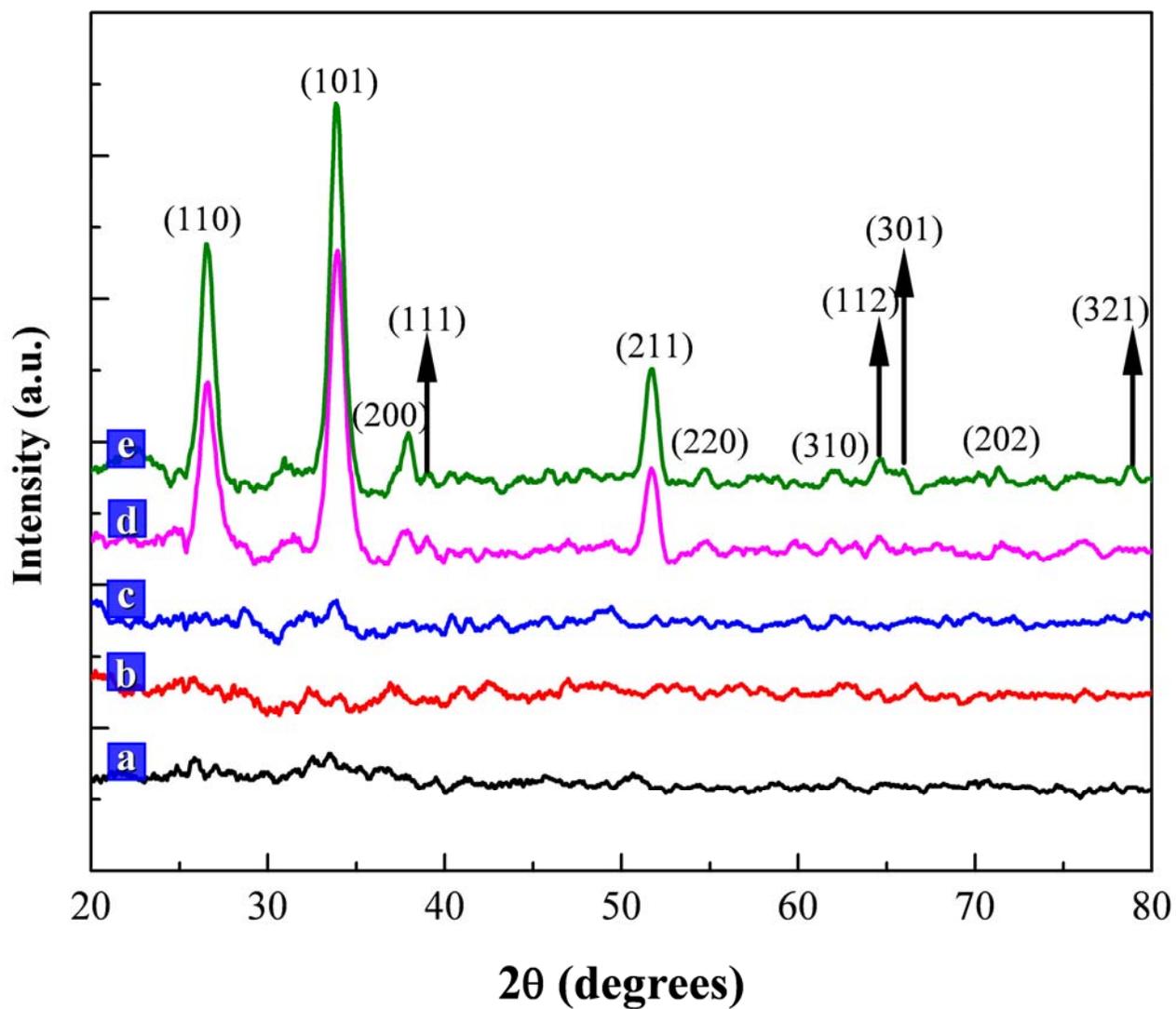
**Figure SI-2.**

**Figure SI-2.** The growth characteristics of ALD-SnO<sub>2</sub> at 250 °C. (a) SEM side views of AAO pores coated with the ALD-SnO<sub>2</sub> of 200, 400, 600, 800, and 1000 cycles (as marked on the left-bottom corner of each case); (b) SEM images for the received SnO<sub>2</sub> nanotubes after 600, 800, and 1000 ALD-cycles; (c) the TEM image for the SnO<sub>2</sub> nanotubes of 800 ALD-cycles (inset: SAED patterns); (d) the HRTEM image for a local area in (c).



**Figure SI-3.**

**Figure SI-3.** The growth characteristics of ALD-SnO<sub>2</sub> at 350 °C. (a) SEM side views of AAO pores coated with the ALD-SnO<sub>2</sub> of 200, 400, 600, 800, and 1000 cycles (as marked on the left-bottom corner of each case); (b) SEM images for the received SnO<sub>2</sub> nanotubes after 400, 600, 800, and 1000 ALD-cycles; (c) the arrays of SnO<sub>2</sub> nanotubes of 1000 ALD-cycles.



**Figure SI-4.**

Figure SI-4. XRD spectra of 200-cycle ALD-SnO<sub>2</sub> at different growth temperatures: (a) 200, (b) 250, (c) 300, (d) 350, and (e) 400 °C.