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Supporting Information

**Tunable crystallographic grain orientation and Raman
fingerprint of polycrystalline SnO thin films**

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S1. XRD patterns of bare SnO films of different thickness

The films with the thickness below 60 nm exhibit a (001) peak located at $\sim 18.4^\circ$ and a (002) peak located at $\sim 37.3^\circ$, respectively. With increasing the thickness of SnO film, a (101) peak located at $\sim 30.0^\circ$ is present, while the (001) and (002) peaks are suppressed. Especially, the (101) peak is dominant and the (001)-orientated peaks are weak when the SnO thickness is above 100 nm.

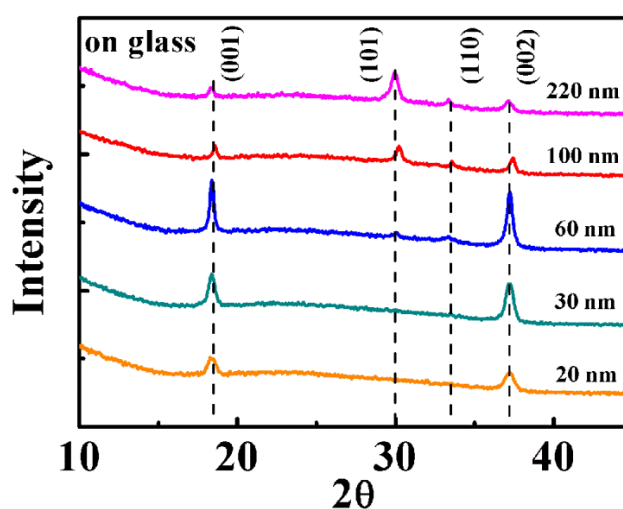


Figure S1. XRD patterns of bare SnO films of different thickness.

S2. XRD patterns of thick SnO films with Al_2O_3 capping layer of different thickness

With increasing $t_{\text{Al}_2\text{O}_3}$, the (001) and (002) peaks are suppressed and the (101) peak is enhanced.

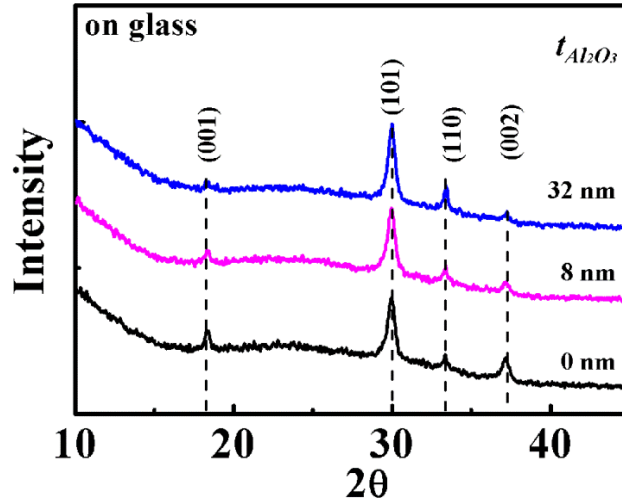


Figure S2. XRD patterns of 220 nm-thick SnO films with Al₂O₃ capping layer of different thickness.

S3. Raman spectra of the SnO films of different thickness

The Raman spectrum of the thin SnO films (20 nm and 30 nm) shows only one peak located at 210 cm⁻¹, in accordance with the (001) preferred orientation measured by the XRD. With the increasing film thickness, the 110 cm⁻¹ peak intensity increases gradually and is comparable to that of the 210 cm⁻¹ peak when the SnO thickness is above 100 nm, coupled with the enhancement of the (101) grains.

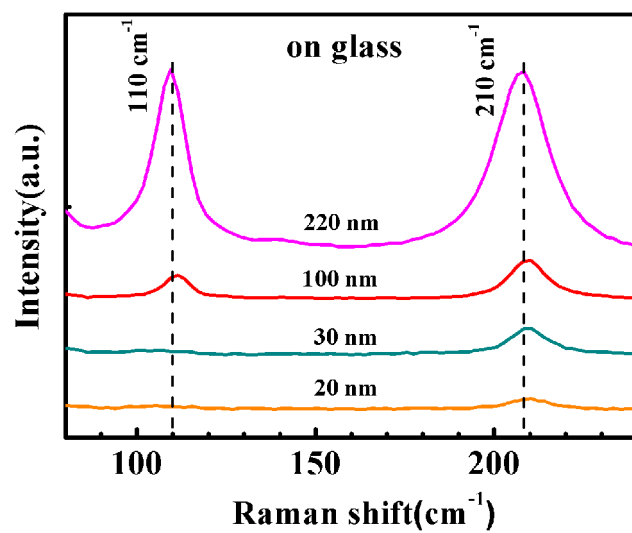


Figure S3. Raman spectra of bare SnO films of different thickness.