Supporting Information

Facile patterning of amorphous indium oxide thin films based on gel-like aqueous precursor for low-temperature，high-performance thin-film transistors

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RMS roughness is defined as:

$$RMS = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n}}$$

where x_i is surface height of every measured point, $\bar{x}$ is average height, and n is the total number of measured points.

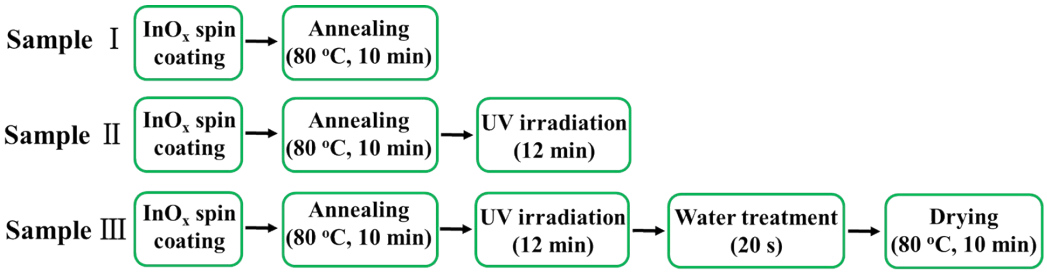

Figure S1. Preparation process-flow of samples.

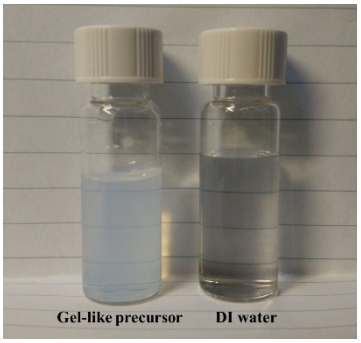

Figure S2. Optical image of gel-like aqueous precursor after filtering with 0.45 μm syringe filter.

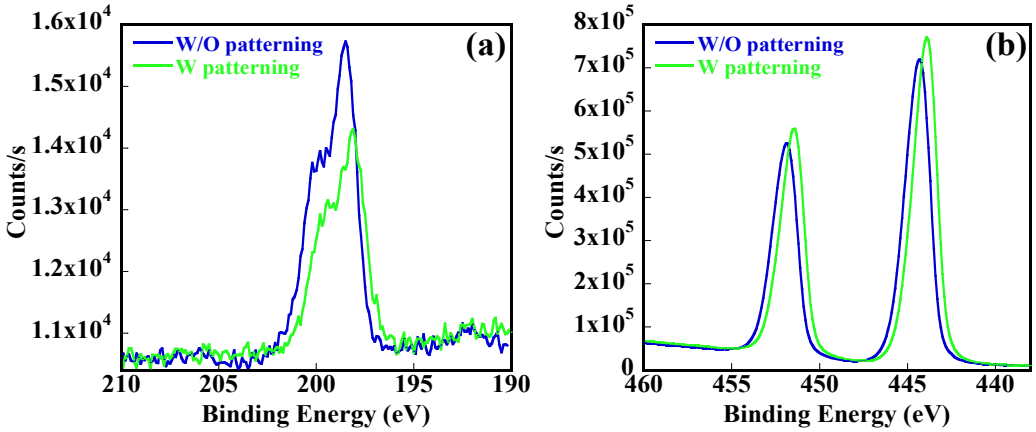

Figure S3. (a) Cl 2p and (b) In 3d XPS spectra collected from InO_x films annealed at 280 °C with and without UV irradiation and water treatment.

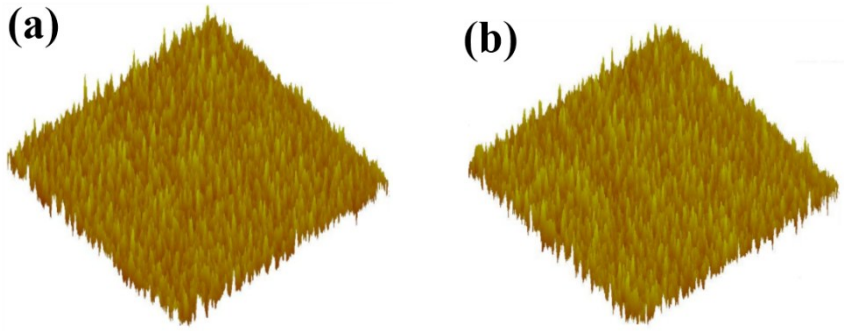

Figure S4. AFM images (5 μm × 5 μm) of InO_x film (a) with and (b) without UV irradiation and water treatment.

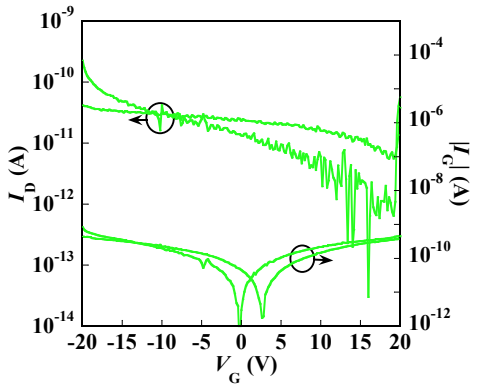

Figure S5. Transfer curves of InO_x TFT without UV irradiation and water treatment post-annealed at 180 °C.

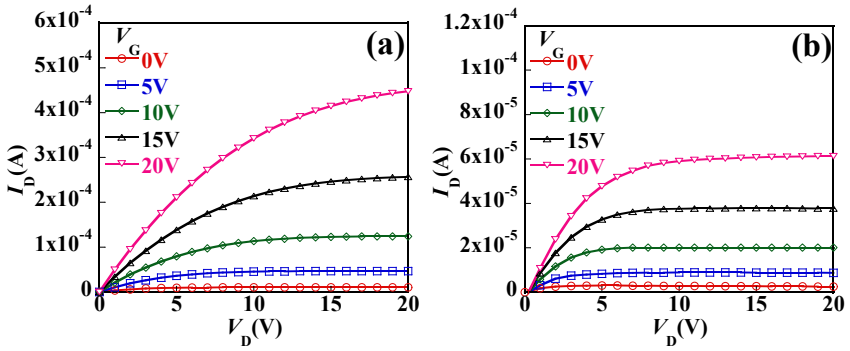

Figure S6. Output characteristics of InO_x TFTs (a) with and (b) without patterning, both devices were post-annealed at 280 °C.

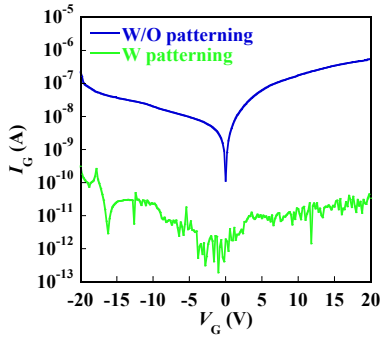

Figure S7. Gate leakage current (I_G) of InO_x TFTs with and without patterning, both devices were post-annealed at 280 °C.

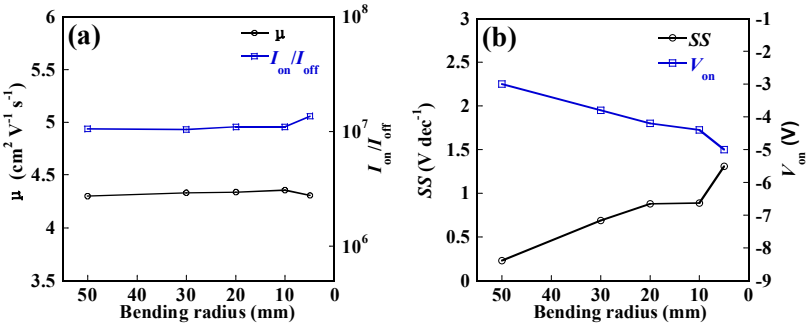

Figure S8. (a) μ and I_{on}/I_{off} , (b) SS and V_{on} variations of InO_x TFT with different bending radius.

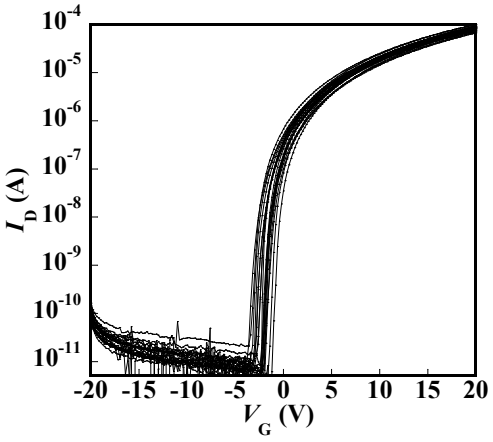

Figure S9. Transfer curves of 20 flexible InO_x TFTs.

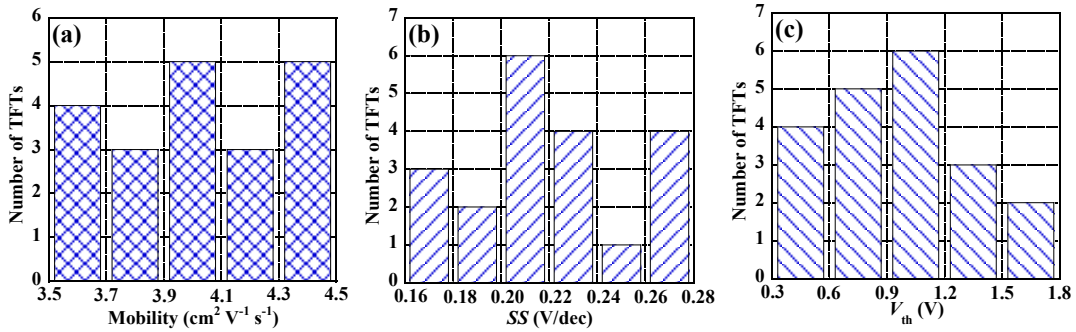

Figure S10. Statistical distributions of (a) mobilities, (b) subthreshold slops, and (c) threshold voltages of 20 flexible InO_x TFTs.

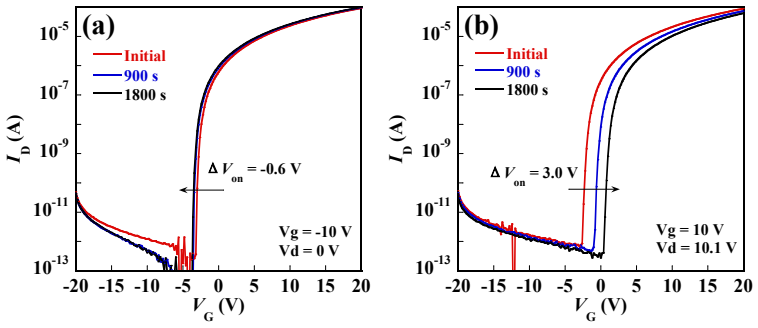

Figure S11. Variations of transfer curves under (a) negative and (b) positive gate bias stress.

Table S1. Comparison of this work to previous InO_x TFTs annealed at 200 °C

	Precursor	Mobility ($cm^2 V^{-1} s^{-1}$)	*SS* (V/dec)	I_{on}/I_{off}	V_{th} (V)
This work	$InCl_3$	3.3	0.3	2.6×10^7	2.9
Ref. 16	$In(NO_3)_3$	3.14	0.16	$>10^9$	~0
Ref. 25	$In(NO_3)_3$	0.03	-	2.2×10^4	1.5
Ref. 36	$In(NO_3)_3$	1.83	0.3	$\sim10^8$	-1.9
Ref. 37	$In(NO_3)_3$	1.44	-	$\sim10^6$	9.6