Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Low-temperature fabrication of Pr-doped In_2O_3 electrospun nanofibers for flexible field-effect transistors†

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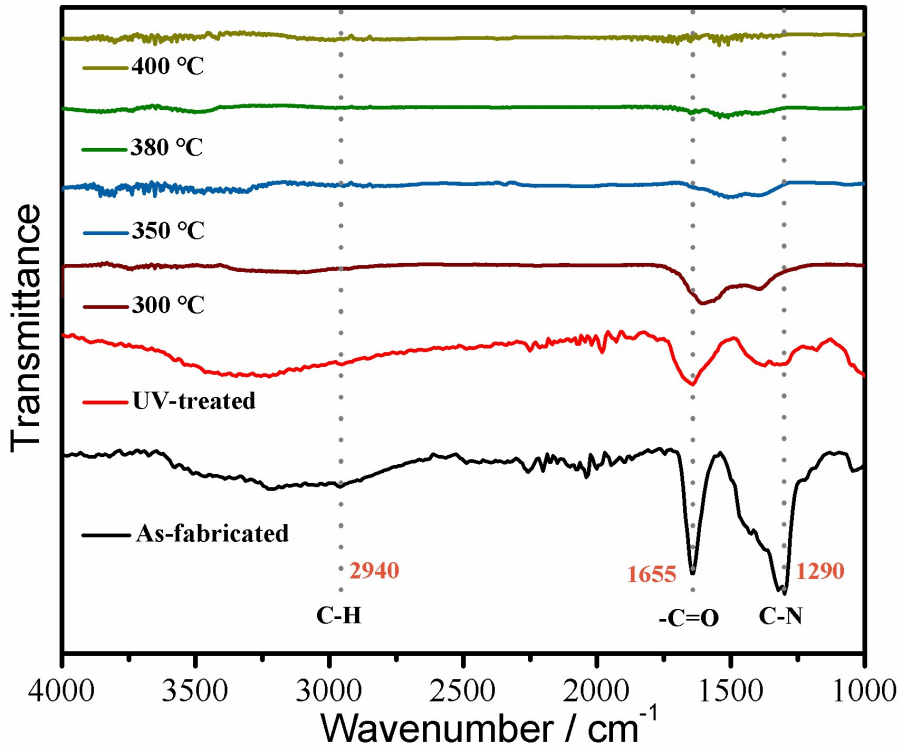

Fig.S1 FT-IR analysis of the InPrO NFs under various conditions.

It can be seen from the figure that the NFs obtained by spinning have obvious PVP infrared characteristic peaks. For example, the peak at 1290 cm^{-1} corresponds to the stretching vibration peak of the -C-N- group connected to the pyrrolidone ring on the main chain of PVP. The peak at 1655 cm^{-1} corresponds to the stretching vibration peak of the -C=O group, and the peak at 2940 cm^{-1} corresponds to the stretching vibration peak of the C-H group on PVP. After UV pretreated, the C-H group at 2940 cm^{-1}, the -C=O group at 1655 cm^{-1} and the -C-N group at 1290 cm^{-1} were also significantly reduced, which proved that UV treatment partially degraded PVP. When annealed at 300 °C, the characteristic peaks of PVP basically disappeared. But there are still some small molecular weight polymer segments. When the annealing temperature increased to 400 °C, the residual carbon chains were basically oxidized and decomposed.

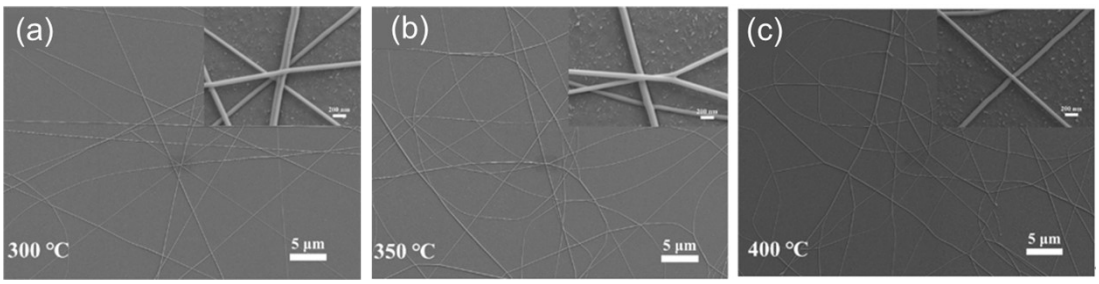

Fig. S2 (a-c) SEM images of InPrO nanofibers after be calcined at 300 ℃, 350 ℃ and 400 ℃ (inset is a high-magnification image).

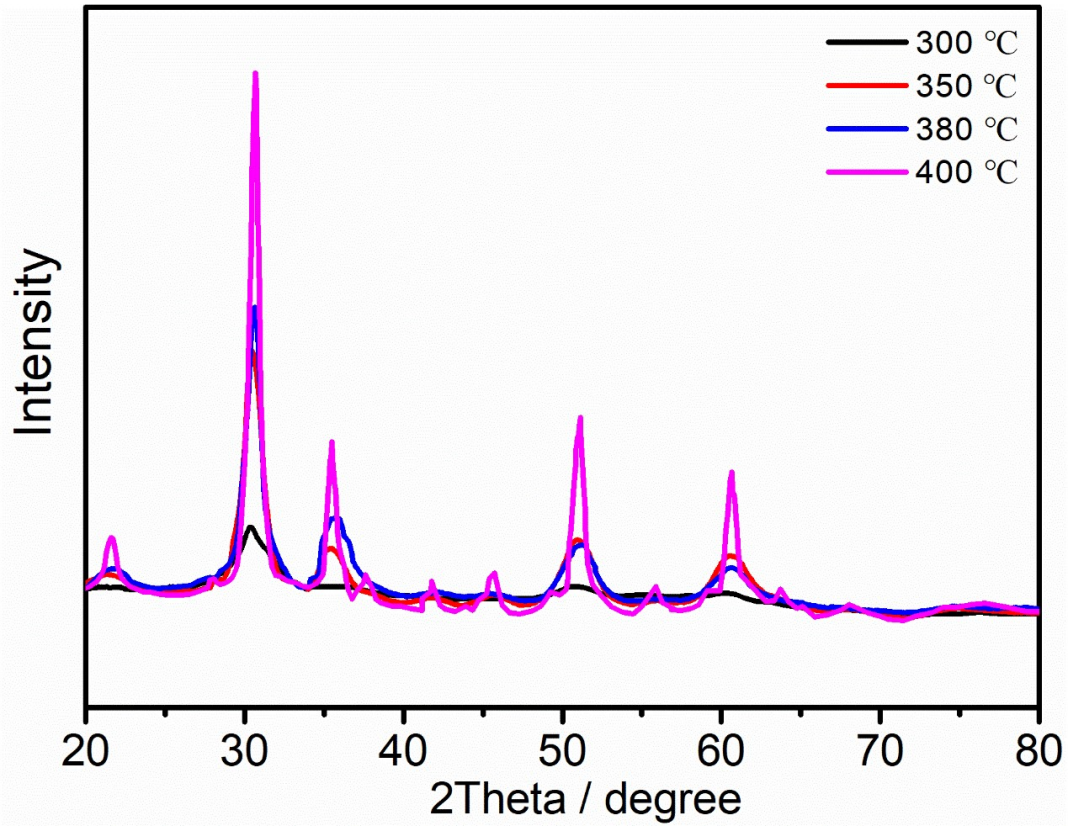

Fig. S3 XRD patterns with different annealing temperatures after normalization.

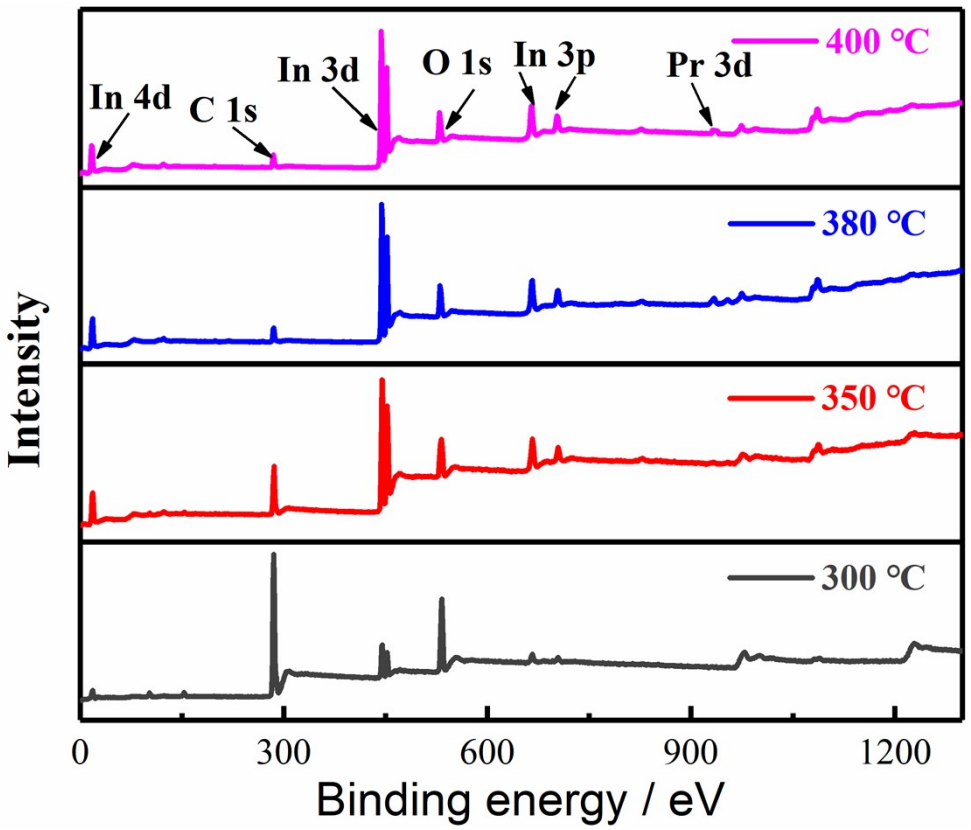

Fig. S4 XPS survey scans for NFs at different annealing temperatures.

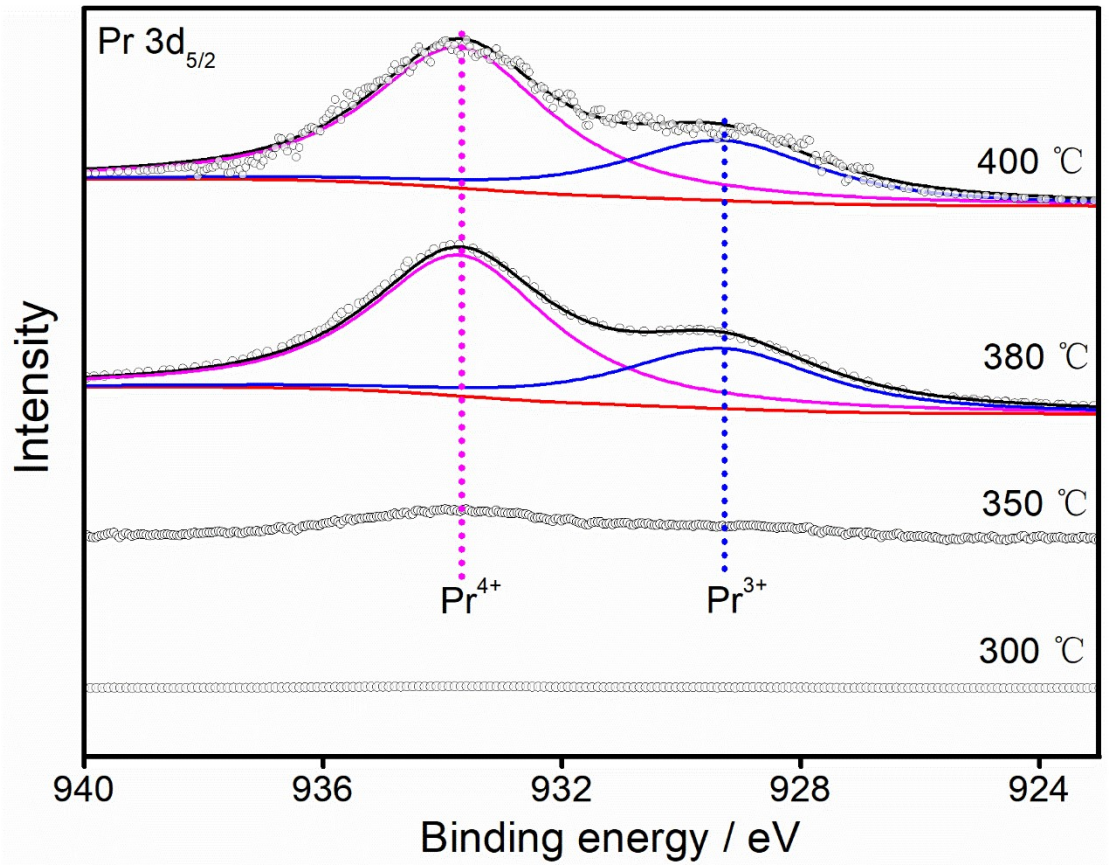

Fig. S5 XPS of Pr 3d spectra of InPrO NFs with different annealing temperatures.

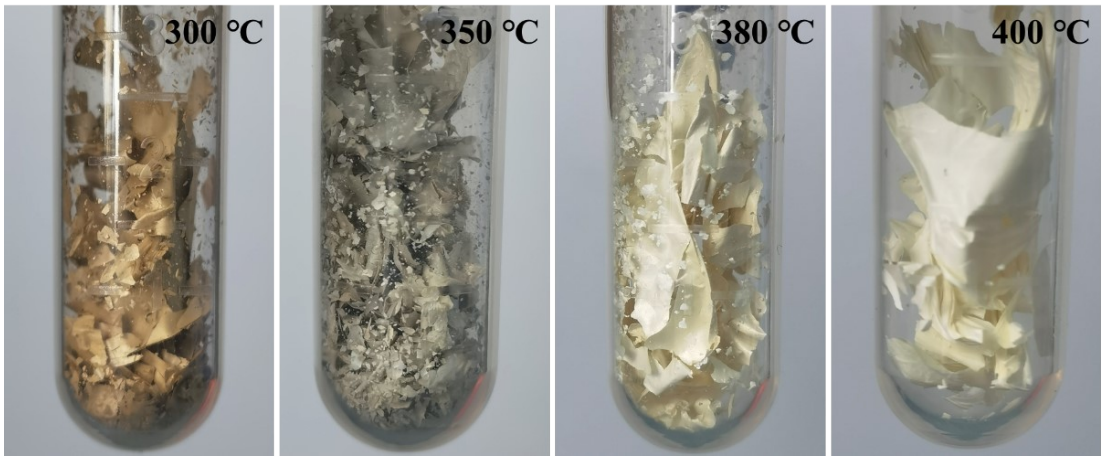

Fig.S6 The digital photographs of InPrO NFs obtained at different annealing temperatures

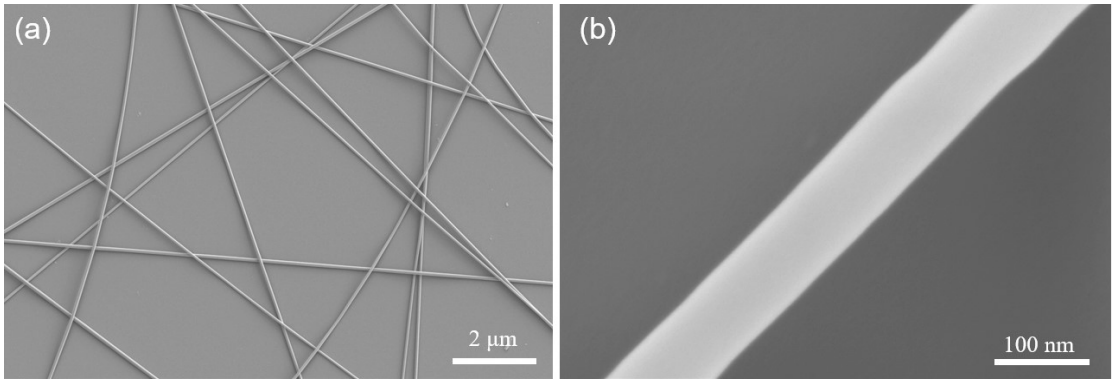

Fig. S7. (a, d) SEM images the channel in InPrO NFs based FET.

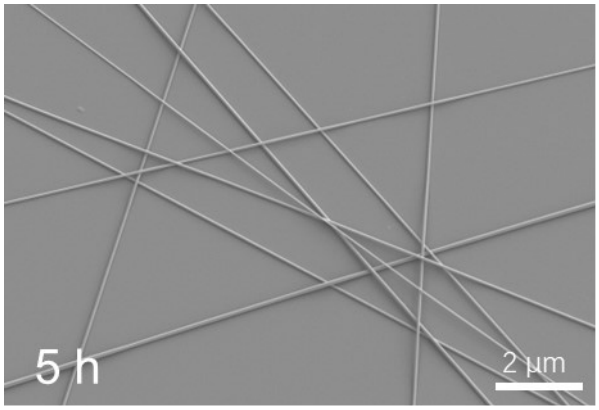

Fig. S8 SEM image of InPrO NFs after annealing at 380 °C for 5 h.

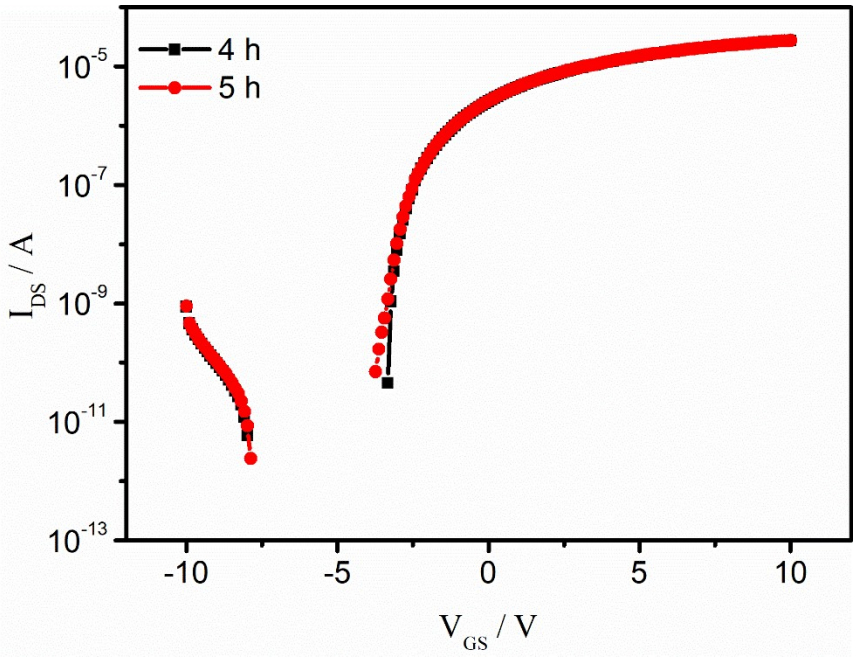

Fig. S9 Transfer curves of the FETs after annealing at 380 °C for 4 h and 5 h.

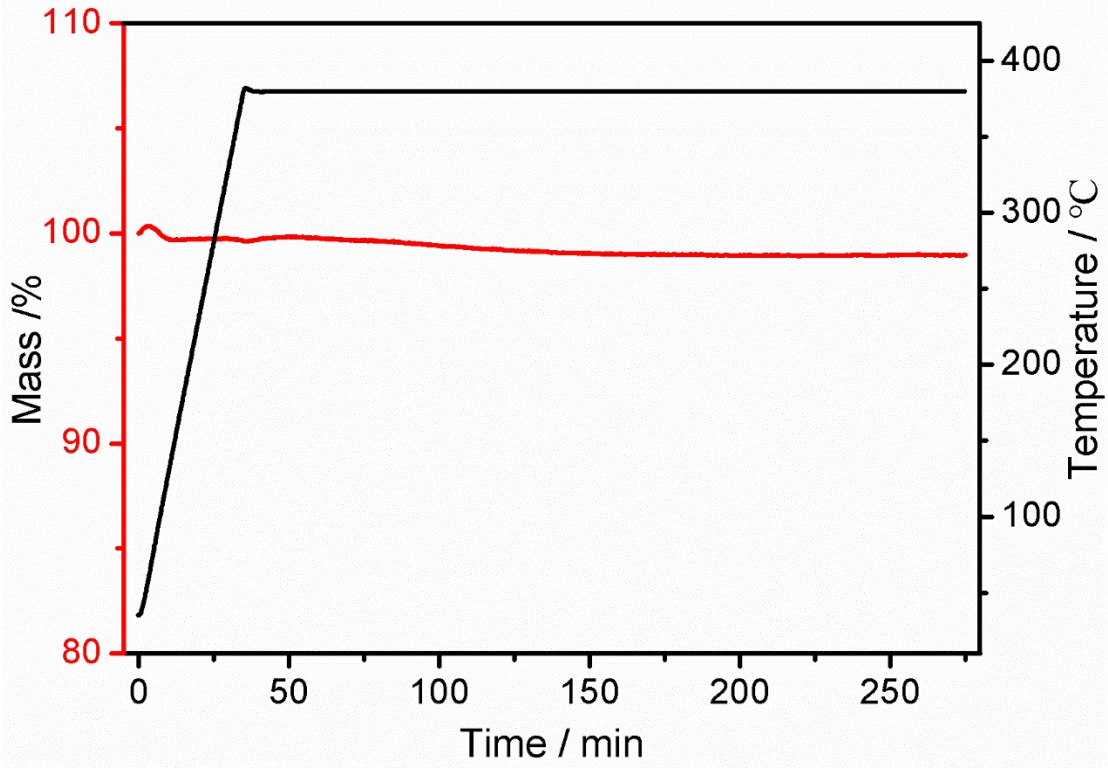

Fig.S10 TG analysis of PI substrate

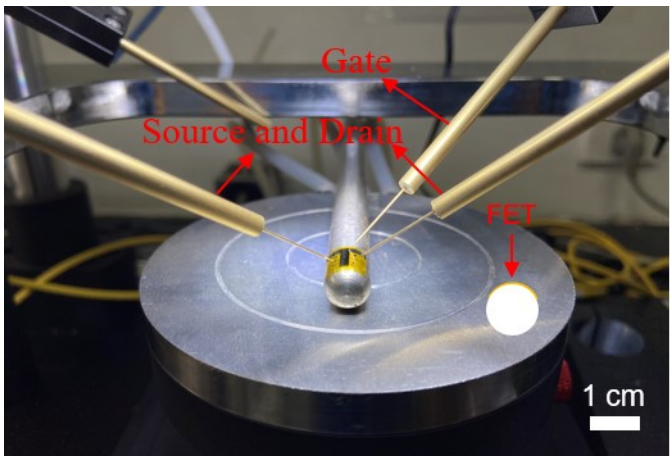

Fig.S11 The f-FET is wrapped around the rigid cylindrical rod with a radius of 5 mm.

Table S1. Results of ICP-MS

Element	Relative atomic mass (g/mol)	Content (wt.%)
In	114.8	70.04
Pr	140.9	2.52
In/Pr molar ratio:**1/0.0293**		

Table S2 The current and resistance of InPrO NFs FETs at different annealing temperatures

Conductivity	Annealing temperature/°C			
	300	350	380	400
Current/A	-1.6×10^{-10}	1.48×10^{-7}	2.55×10^{-6}	5.79×10^{-6}
Resistance/Ω	6.25×10^{10}	6.76×10^{7}	3.92×10^{6}	1.73×10^{6}