

Supporting Information for

Phase transition-driven modulation of ferroelectricity and photovoltaic effect in sol-gel derived BiFeO₃-based films

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Table S1 Variation of R3c and P4mm phase contents and corresponding cell parameters of
BP_xFCO films.

samples	Space group	Fraction (%)	a (Å)	b (Å)	c (Å)	V (Å ³)
P-0	R3c	92.1	5.62	5.62	13.78	377.59
	P4mm	7.9	3.95	3.95	4.27	66.48
P-5	R3c	88.9	5.59	5.59	13.89	376.20
	P4mm	11.1	3.62	3.62	4.86	63.84
P-10	R3c	87.5	5.60	5.60	13.87	376.35
	P4mm	12.5	3.73	3.73	4.64	64.38
P-15	R3c	75.2	5.59	5.59	13.71	371.38
	P4mm	24.8	3.80	3.80	4.44	64.13
P-20	R3c	74.8	5.62	5.62	13.75	375.73
	P4mm	25.2	3.64	3.64	4.78	63.21

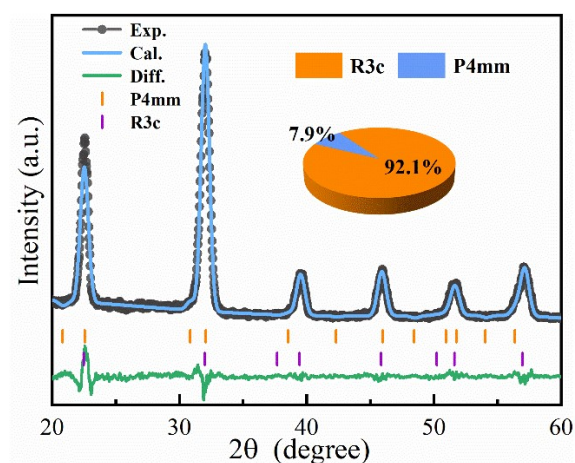


Fig. S1 XRD refinement results for P-0 film.

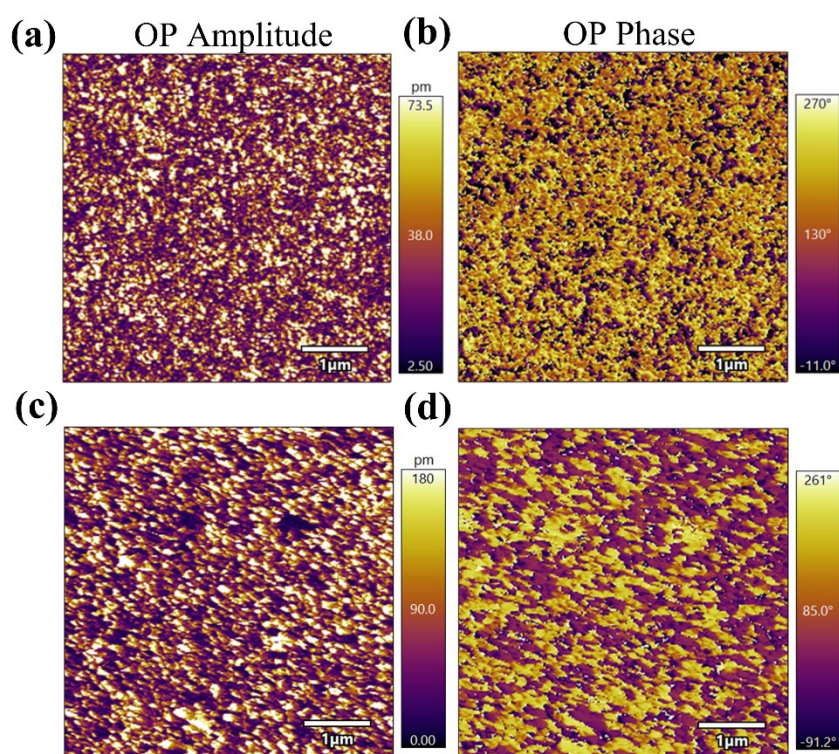


Fig. S2 Out-of-plane (OP) amplitude and phase images of (a)(b) P-0 and (c)(d) P-15 films.

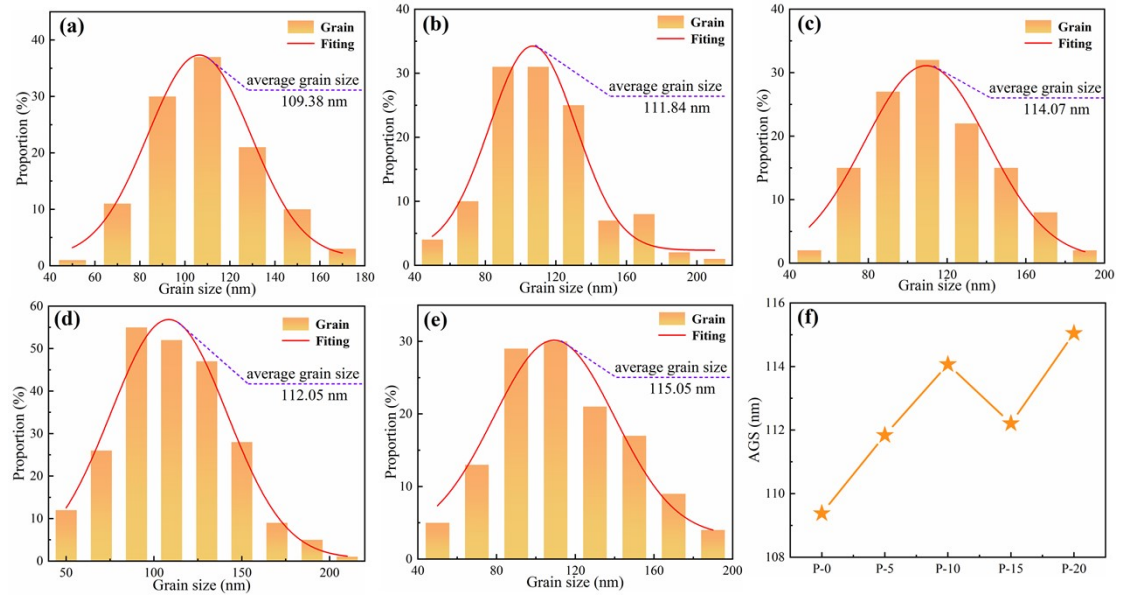


Fig. S3 The histograms of average grain size of (a) P-0, (b) P-5, (c) P-10, (d) P-15, and (e) P-20 films. (f) Variation in average grain size of BP_xFCO films as a function of Pr content.

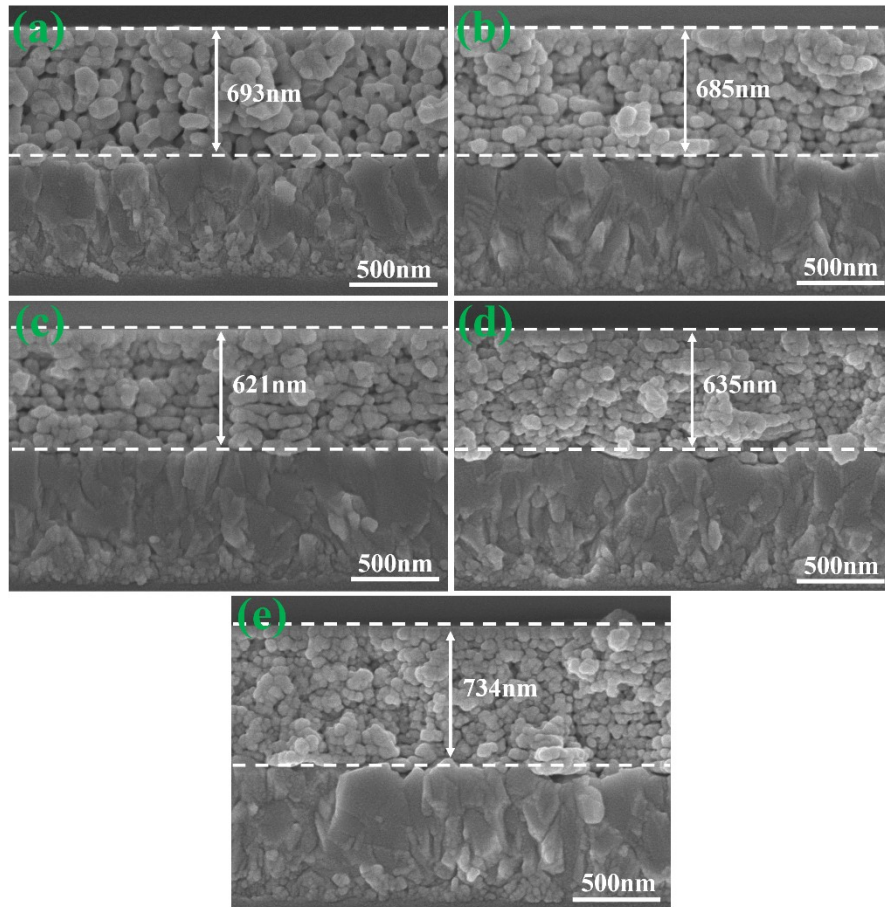


Fig. S4 Cross-sectional SEM images for (a) P-0, (b) P-5, (c) P-10, (d) P-15, and (e) P-20 films.

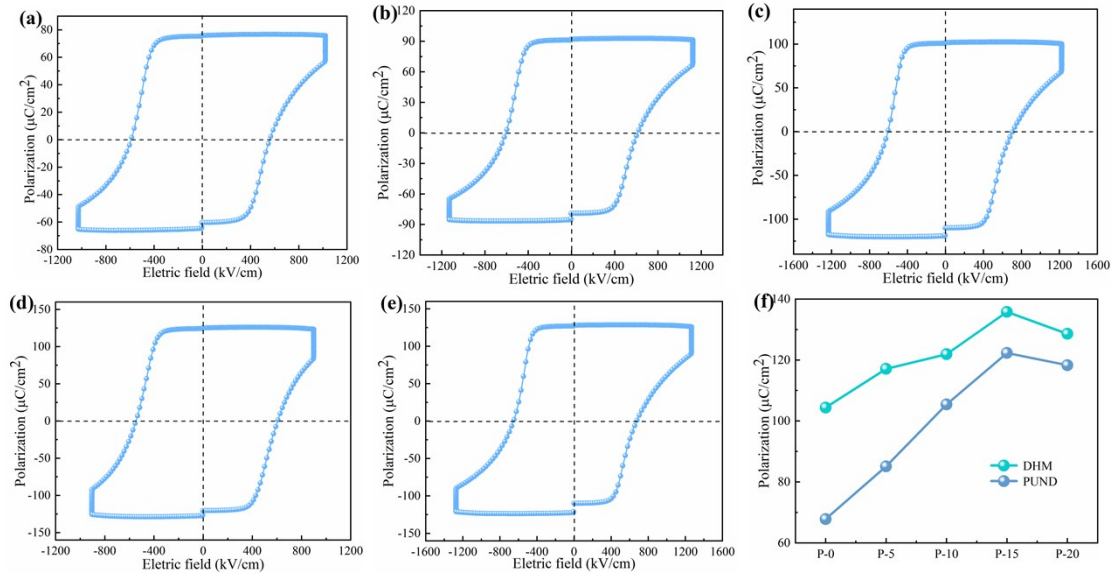


Fig. S5 (a-e) P-E hysteresis loops of BPFfCO films with different Pr concentrations under an applied electric field. (f) Comparison of remanent polarization values extracted by the Dynamic Hysteresis Measurement (DHM) and Positive-Up Negative-Down (PUND) methods for different doping levels.

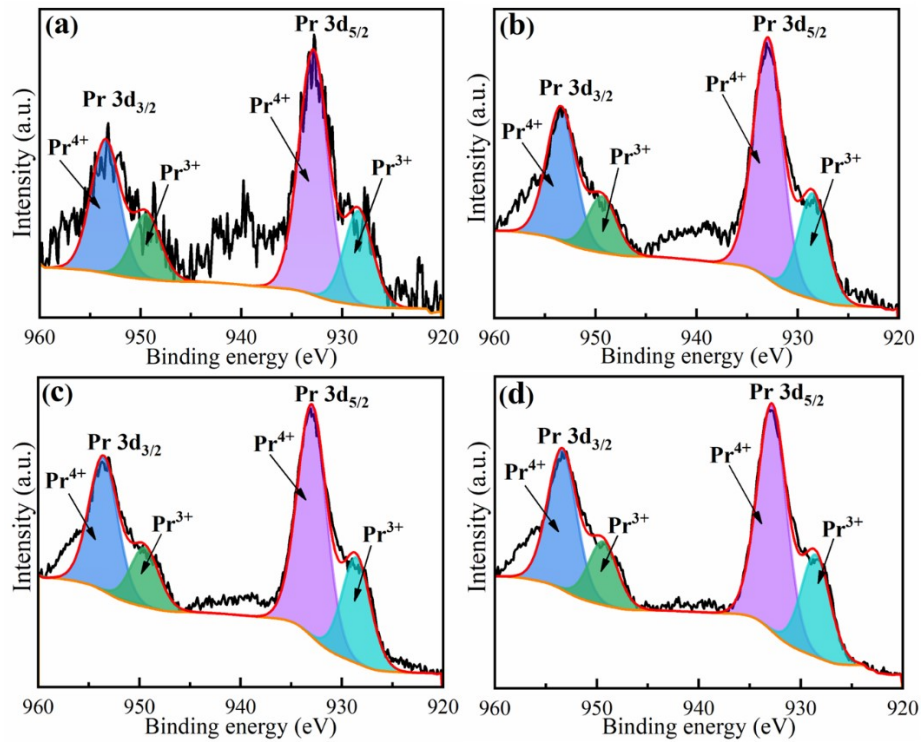


Fig. S6 Pr 3d orbital XPS fitting diagram of (a) P-5, (b) P-10, (c) P-15, and (d) P-20 samples.