

Supporting Information

Investigation on the Fast Phase Transition Mechanism of Flow-induced oriented iPB-1

Lincheng Ji, Heng Zhang, Youxin Ji*, Fengmei Su*, Chuntai Liu

College of Materials Science and Engineering, National Engineering Research Center for Advanced Polymer Processing Technology, The Key Laboratory of Material Processing and Mold of Ministry of Education, Zhengzhou University, Zhengzhou, 450002, P.R.China

	page
1. WAXD Data of Annealing at Different T_a for 5 min.....	2
2. WAXD Data of Annealing at 130 °C with Different t_a	5
3. WAXD Data of Annealing at 120 °C with Different t_a	7
References.....	10

1. WAXD Data of Annealing at Different T_a for 5 min

* correspondence authors: yxji@zzu.edu.cn, fmsu@zzu.edu.cn

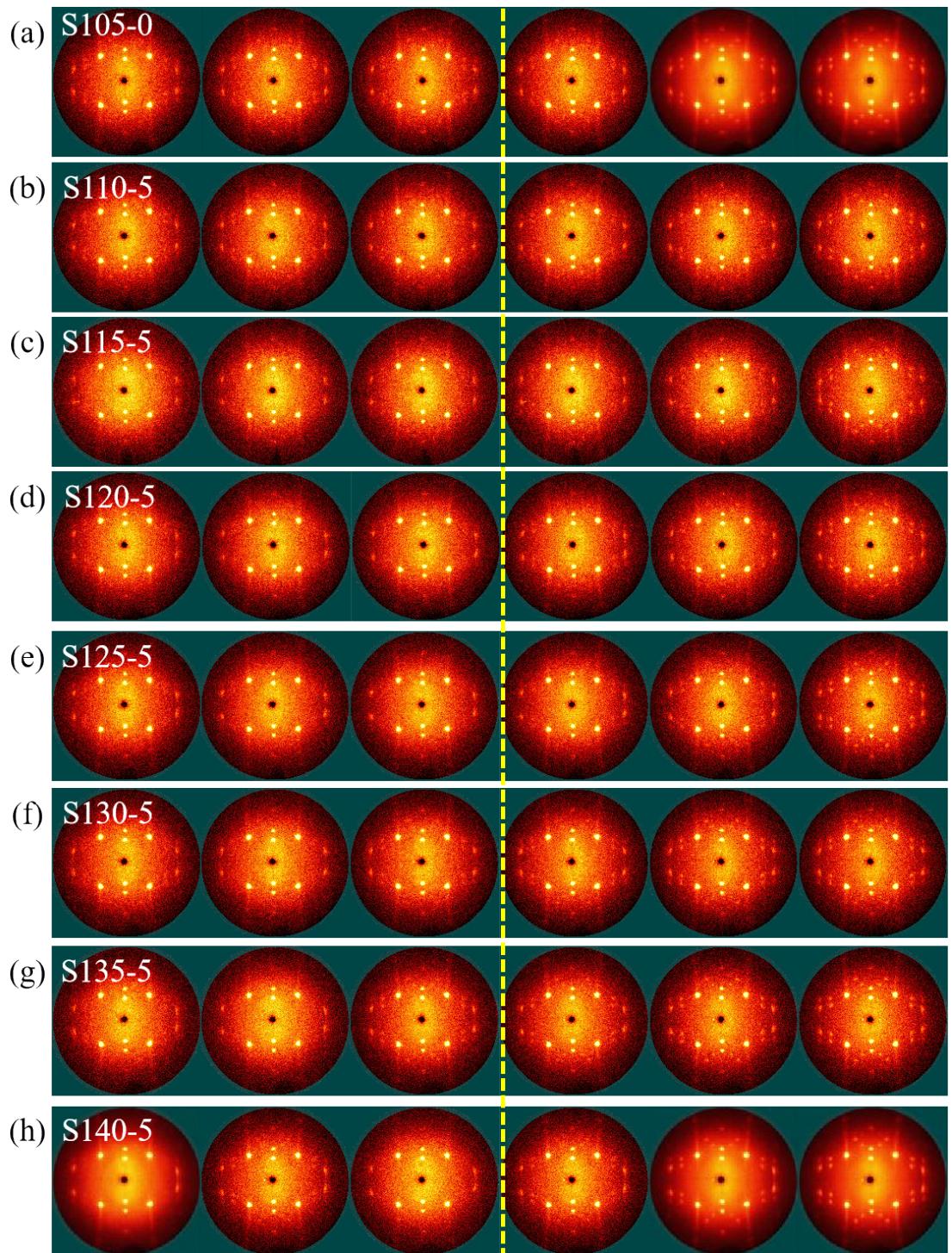


Figure S1. Representative 2D WAXD patterns of (a) S105-0, (b) S110-5, (c) S115-5, (d) S120-5, (e) S125-5, (f) S130-5, (g) S135-5 and (h) S140-5, the yellow dotted line separates the “Annealing” process (on the left side) and “Crystallization” process (on the right side), respectively.

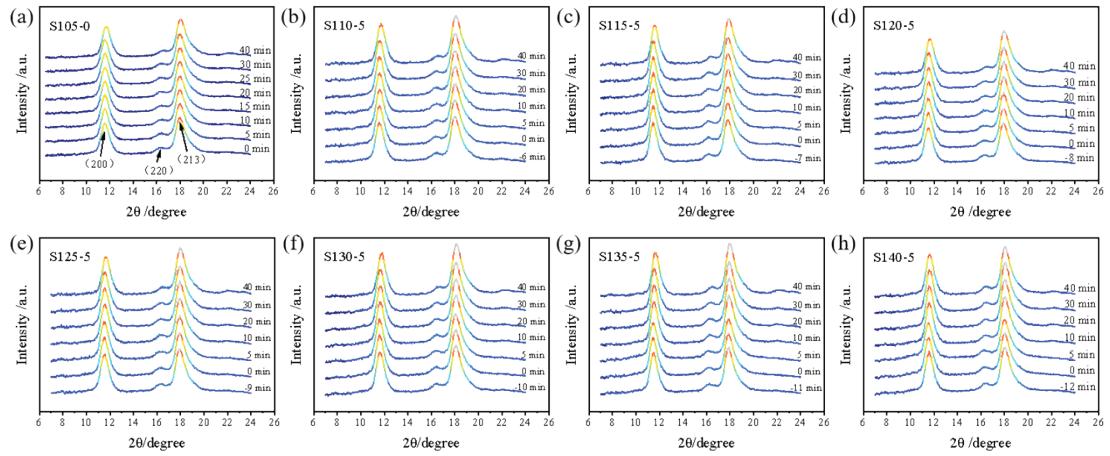


Figure S2. Representative 1D WAXD curves of (a) S105-0, (b) S110-5, (c) S115-5, (d) S120-5, (e) S125-5, (f) S130-5, (g) S135-5 and (h) S140-5, respectively.

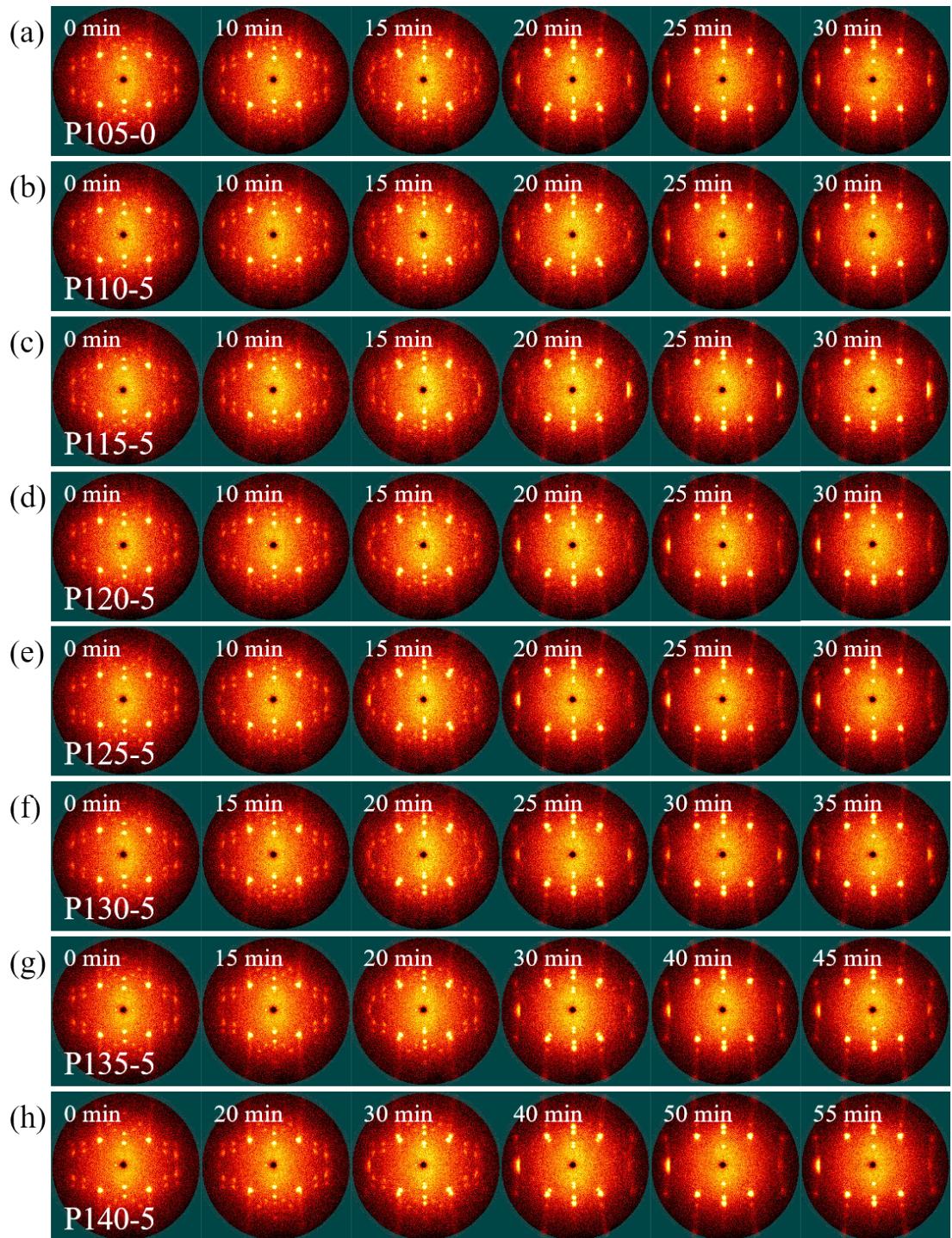


Figure S3. Representative 2D WAXD patterns of (a) P105-0, (b) P110-5, (c) P115-5, (d) P120-5, (e) P125-5, (f) P130-5, (g) P135-5 and (h) P140-5, respectively.

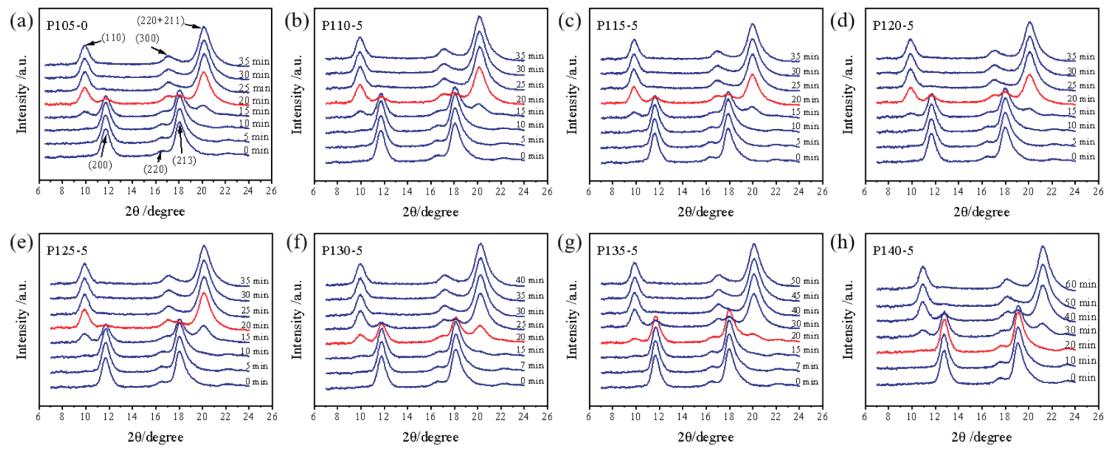


Figure S4. Representative 1D WAXD curves of (a) P105-0, (b) P110-5, (c) P115-5, (d) P120-5, (e) P125-5, (f) P130-5, (g) P135-5 and (h) P140-5, respectively.

2. WAXD Data of Annealing at 130 °C with Different t_a

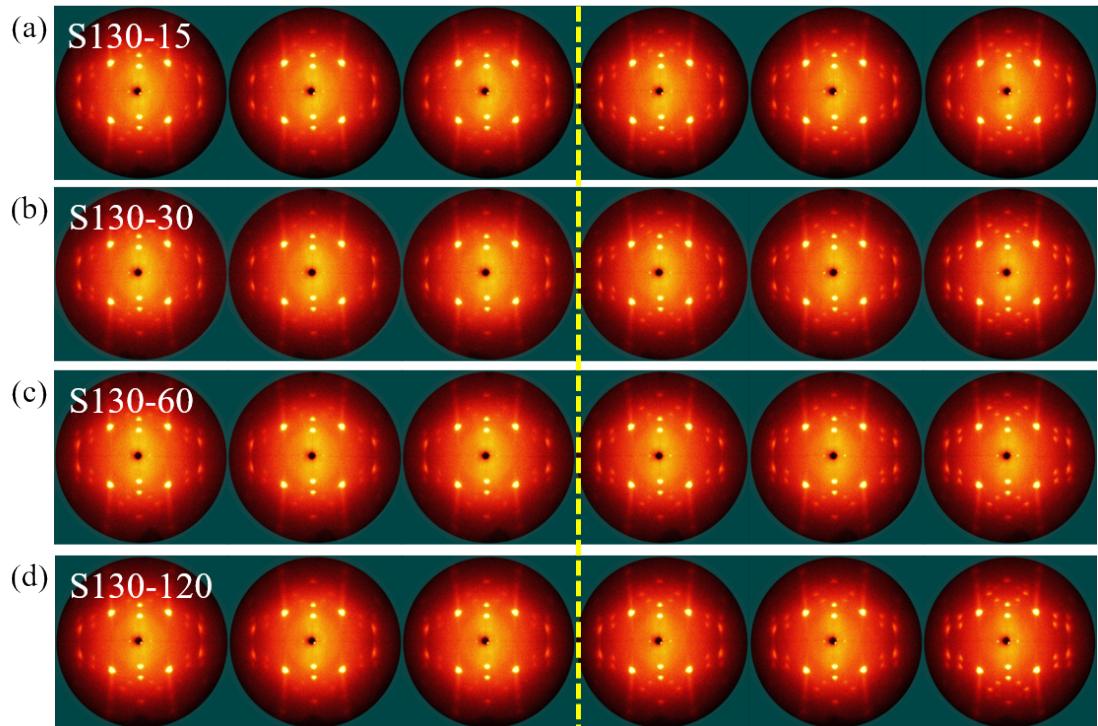


Figure S5. Representative 2D WAXD patterns of (a) S130-15, (b) S130-30, (c) S130-60 and (d) S130-120. FD is horizontal, as indicated by the double-headed arrow.

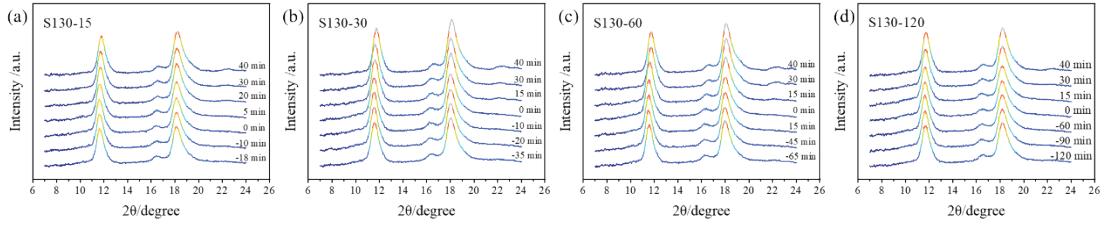


Figure S6. Representative 1D WAXD curves of (a) S130-15, (b) S130-30, (c) S130-60 and (d) S130-120, respectively.

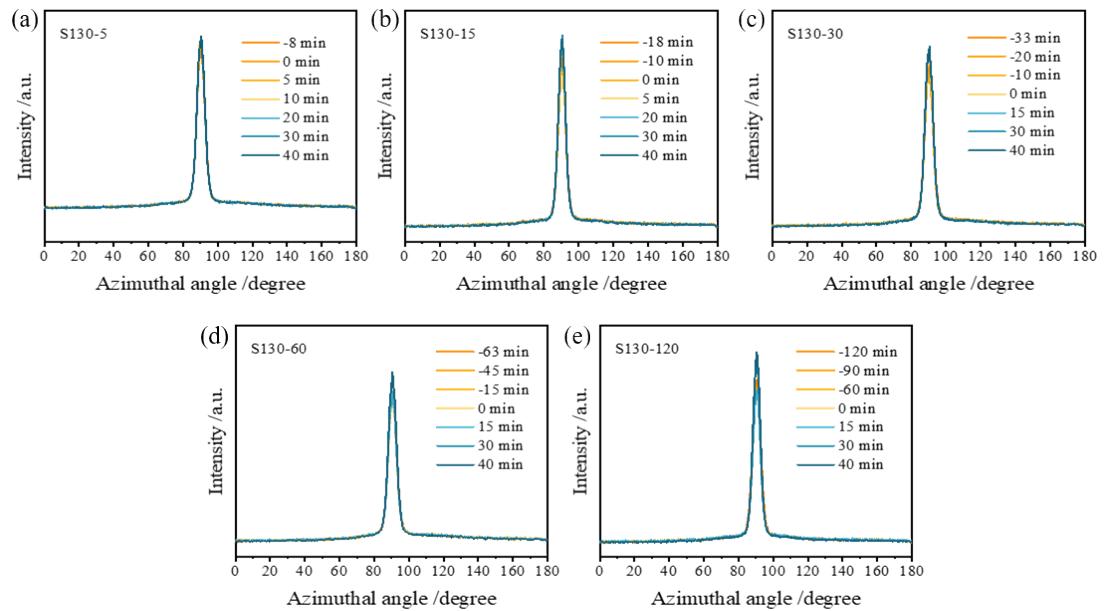


Figure S7. Representative the azimuthal angle distribution of II(200) plane of (a) S130-5, (b) S130-15, (c) S130-30, (d) S130-60 and (e) S130-120, respectively.

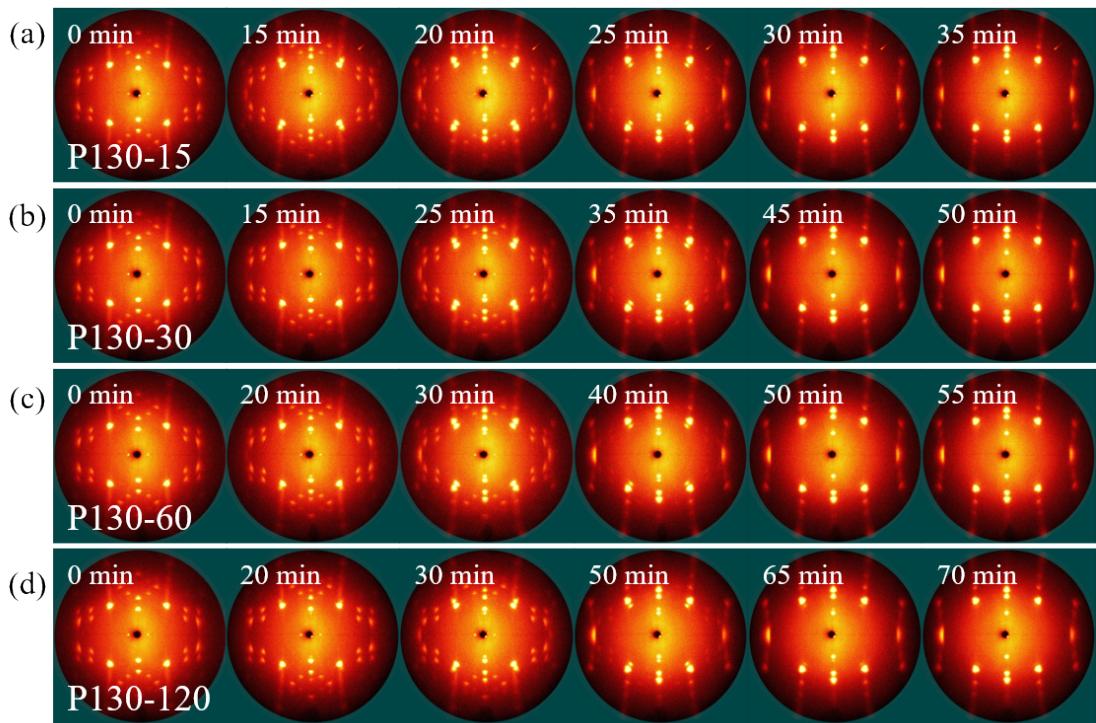


Figure S8. Representative 2D WAXD patterns of (a) P130-15, (b) P130-30 (c) P130-60 and (d) P130-120, respectively.

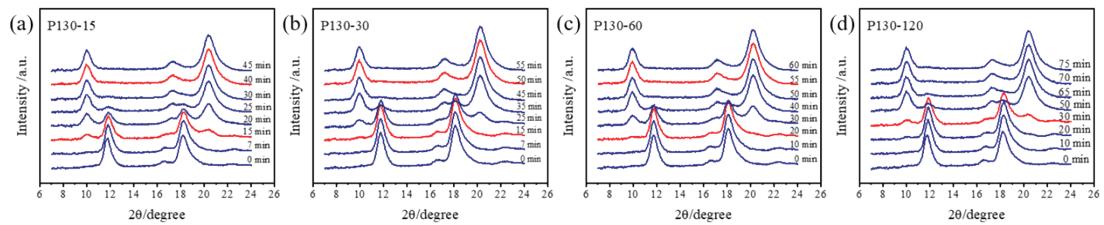


Figure S9. Representative 1D WAXD curves of (a) P130-15, (b) P130-30, (c) P130-60 and (d) P130-120, respectively.

3. WAXD Data of Annealing at 120 °C with Different t_a

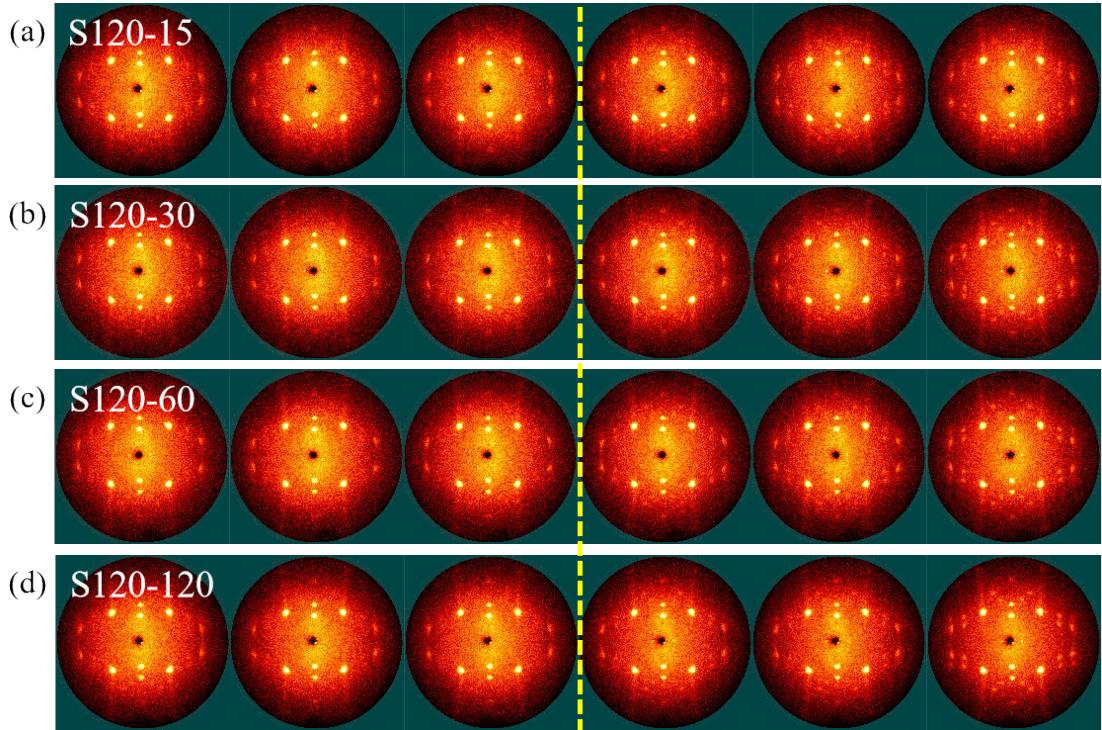


Figure S10. Representative 2D WAXD patterns of (a) S120-15, (b) S120-30, (c) S120-60 and (d) S120-120. FD is horizontal, as indicated by the double-headed arrow.

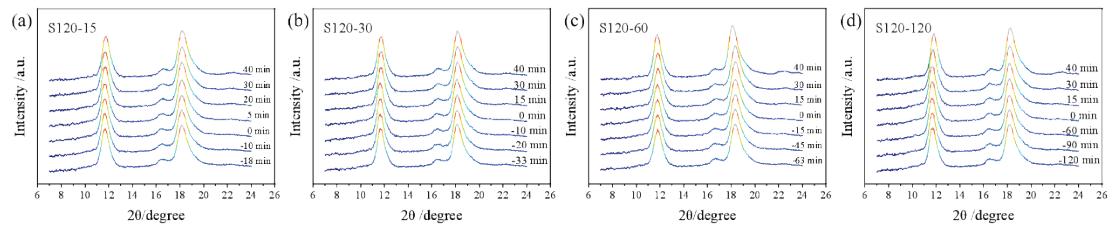


Figure S11. Representative 1D WAXD curves of (a) S120-15, (b) S120-30, (c) S120-60 and (d) S120-120, respectively.

The lateral size is calculated by Scherrer equation as follows¹:

$$D = k\lambda/\beta\cos\theta$$

where, k is a constant (usually 0.89), λ is the wavelength of X-ray, β is the full width at half maximum (FWHM) of the diffraction peak, and θ is the diffraction angle.

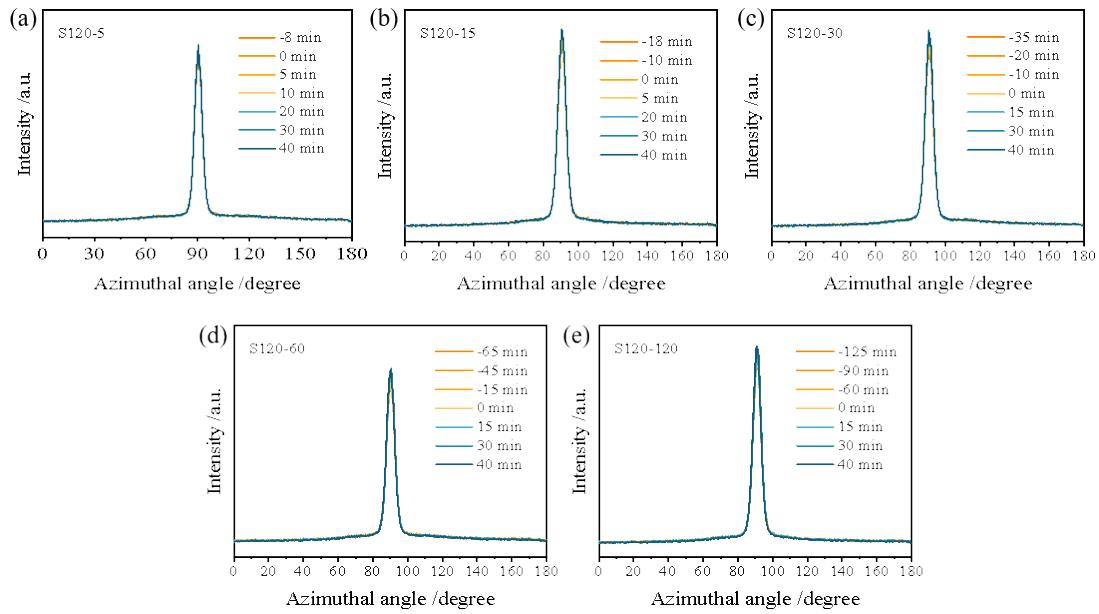


Figure S12. Representative azimuthal angle distribution of II(200) plane of (a) S120-5, (b) S120-15, (c) S120-30, (d) S120-60 and (e) S120-120, respectively.

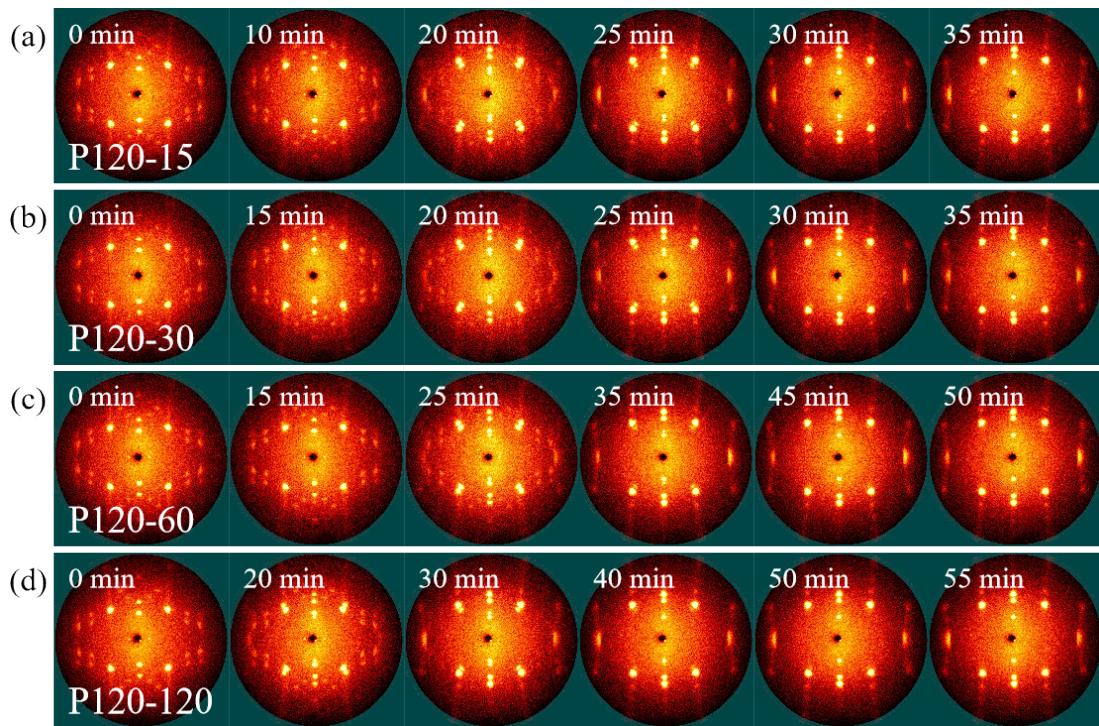


Figure S13. Representative 2D WAXD patterns of (a) P120-15, (b) P120-30 (c) P120-60 and (d) P120-120, respectively. FD is horizontal, as indicated by the double-headed arrow.

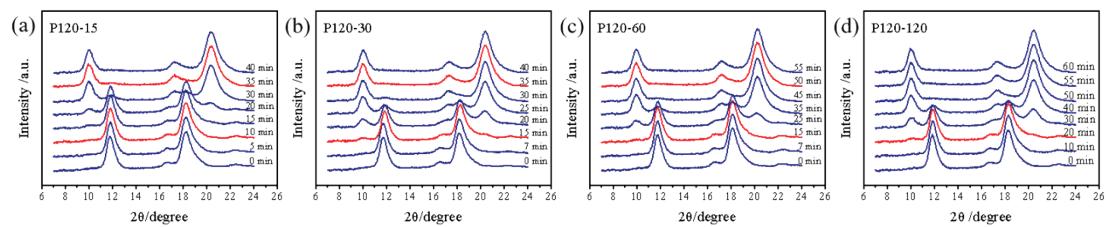


Figure S14. Representative 1D WAXD curves of (a) P120-15, (b) P120-30, (c) P120-60 and (d) P120-120, respectively.

References

1. A. L. Patterson, *Physical Review*, 1939, **56**, 978-982.