ELECTRONIC SUPPLEMENTARY INFORMATION (ESI)

Poly (butylene succinate) Filaments for Fused Deposition Modelling (FDM) 3D-Printing

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1. Non-isothermal crystallization data of polymer materials

Sample	φ (℃/min)	$t_{1/2}$ (min)	reference
PET	10	1.17	【1】
PBT	10	1.00	【2】
PLA	10	2.30	【3】
PBS	10	0.82	【4】

2. GPC data of linear PBS and LCB-PBS.

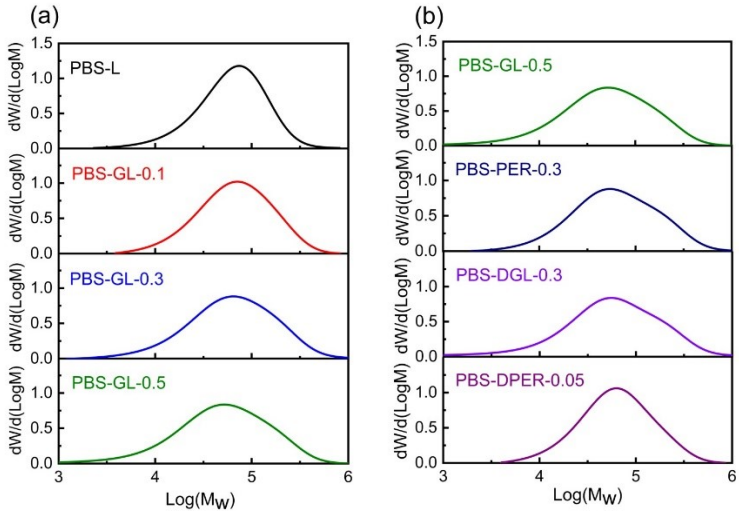

Figure S1. Molecular weight distribution curves of PBS polyesters. (a) Branching agent content (b) Types of branching agent.

3. Structural characterization of linear PBS and LCB-PBS

The chemical structure of samples was characterized by the Fourier transform infrared spectroscopy (FTIR) of the Frontier FT-IR spectrometer (Nicolet6700, American) in the attenuated total reflection (ATR) mode.

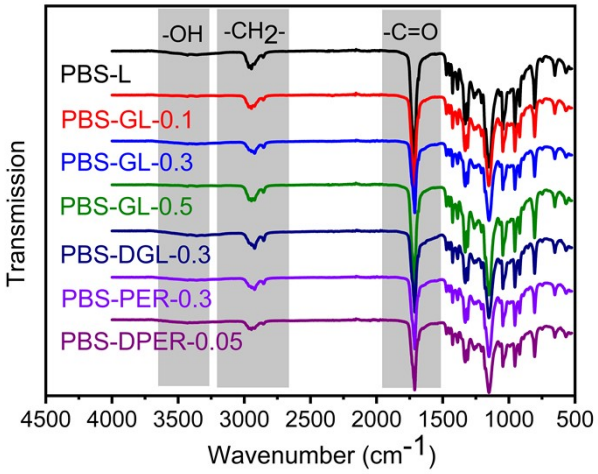

Figure S2. FT-IR results for linear and LCB PBS polyesters.

4. Spherulite growth of linear PBS and LCB-PBS

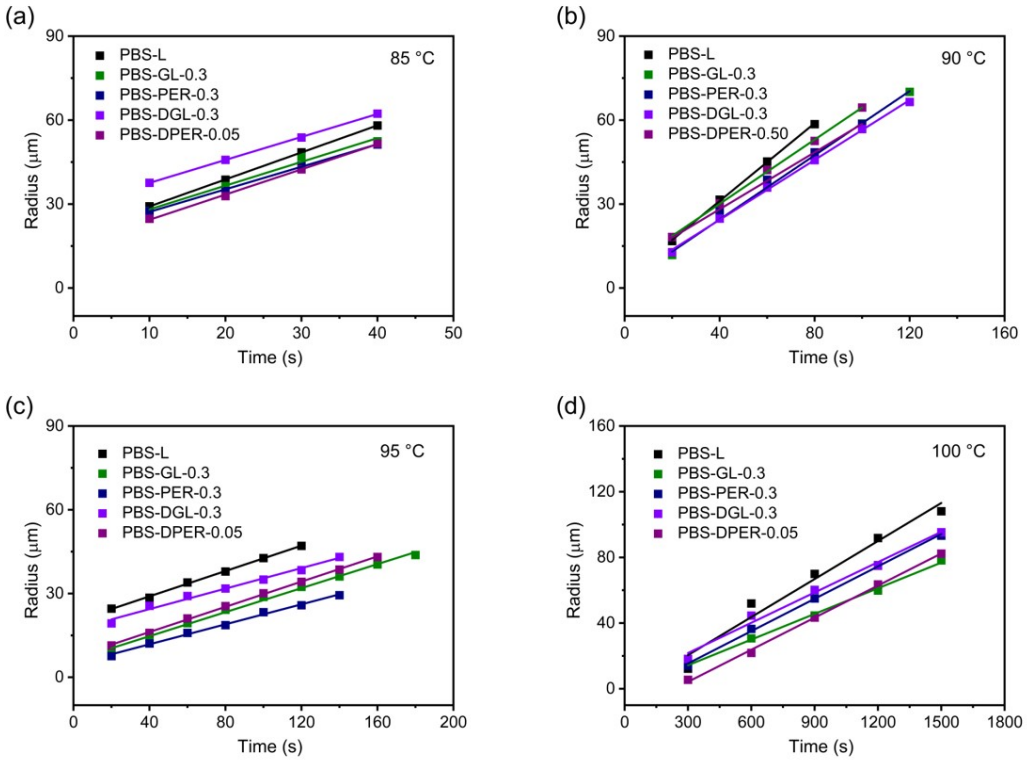

Figure S3. The relationship between spherulite radius and times at different temperature. (a)85 ℃; (b)90 ℃; (c)95 ℃; (d)100 ℃.

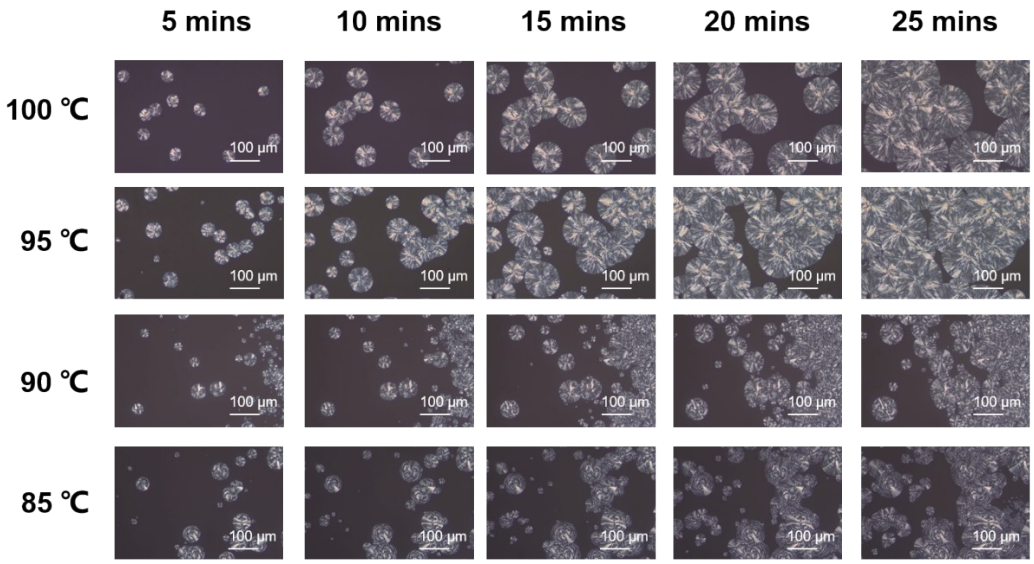

Figure S4. POM images of PBS during isothermal crystallization at different temperatures for 25 min.

5. Spherulite growth of linear PBS and LCB-PBS

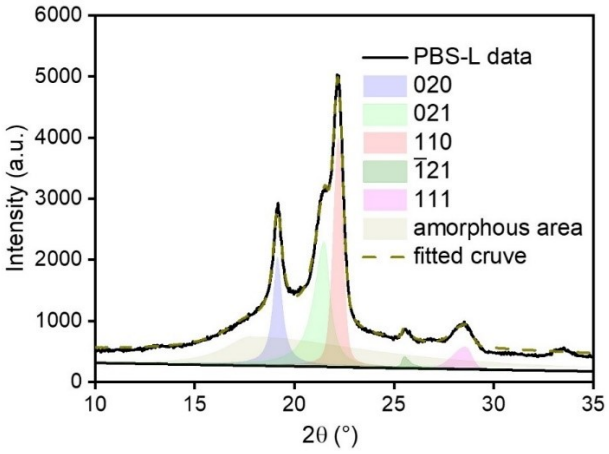

Figure S5. Example of the peak deconvolution of PBS using Jade 9.0 software.

6. 3D printing process temperature picture.

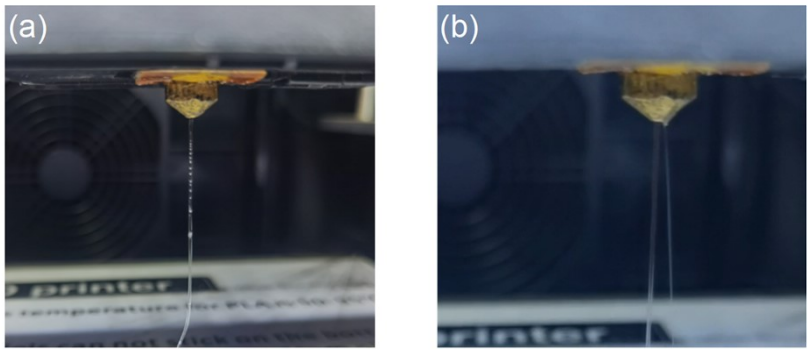

Figure S6. (a) uneven melting; (b) material leakage.

ESI Reference

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[2] Al-Mulla A.; Mathew J.; Yeh S.; Gupta R. Nonisothermal crystallization kinetics of PBT nanocomposites.*Composites. Part A, Applied science and manufacturing.* **2008**, 39(2), 204-217. DOI: 10.1016/j.compositesa.2007.11.001.

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