Supporting information

Homocomposites of Polylactide (PLA) with Induced Interfacial Stereocomplex Crystallites

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Particles morphology

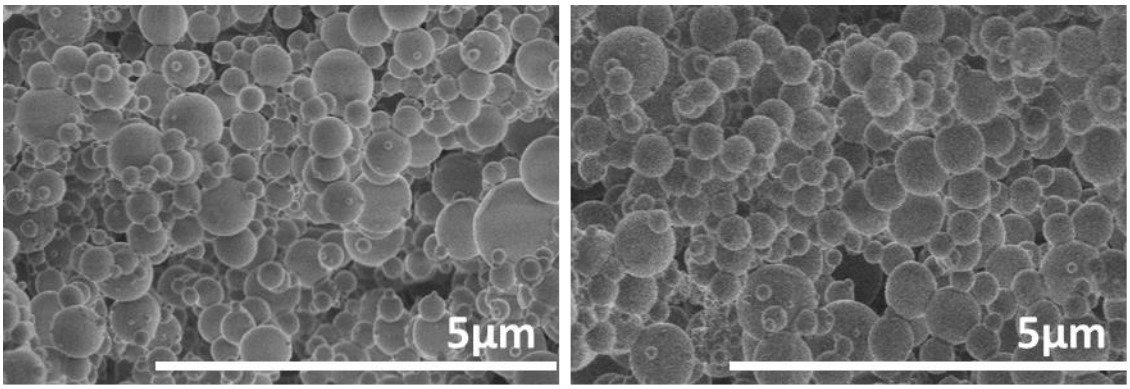


Figure S1. Morphology of the particles used as fillers, PLLA (left) and PLA stereocomplex (right).

Materials properties after extrusion

Table S1. Particulate-homocomposite molar masses and dispersity after melt-blending.

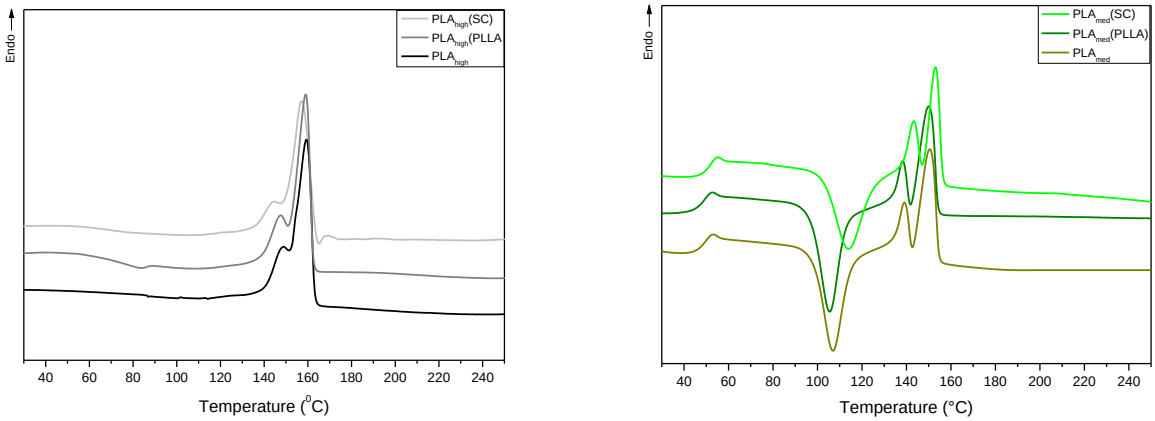
Material	M_n (Da x 10^5)[a]	$Đ$[a]
PLA_{high}	0.87	1.2
PLA_{high}(PLLA)	0.78	1.3
PLA_{high}(SC)	0.81	1.2
PLA_{med}	1.57	1.1
PLA_{med}(PLLA)	1.43	1.1
PLA_{med}(SC)	1.52	1.1
PLA_{low}	1.04	1.1
PLA_{low}(PLLA)	1.00	1.1
PLA_{low}(SC)	0.98	1.1

[a]Determined by SEC using $CHCl_3$ as the eluent and PS standards.

Particulate-homocomposites crystallization behavior

a)

b)



c)

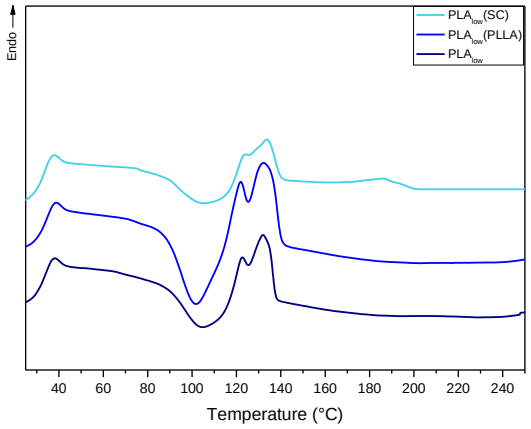


Figure S2. DSC thermograms of the 2nd heating scan of a) PLA_{high}, PLA_{high}(PLLA) and PLA_{high}(SC); b) PLA_{med}, PLA_{med}(PLLA) and PLA_{med}(SC) and c) PLA_{low}, PLA_{low}(PLLA) and PLA_{low}(SC).

Mechanical properties

Table S2. Elongation at break of the particulate-homocomposite materials.

Material	ε (%)
PLA_{high}	1,95 ± 0,3
PLA_{high}(PLLA)	3,17 ± 0,4
PLA_{high}(SC)	2,28 ± 0,3
PLA_{med}	4,5 ± 0,6
PLA_{med}(PLLA)	3,94 ± 0,6
PLA_{med}(SC)	3,15 ± 0,4
PLA_{low}	3,52 ± 0,6
PLA_{low}(PLLA)	3,33 ± 0,5
PLA_{low}(SC)	1,7 ± 0,2

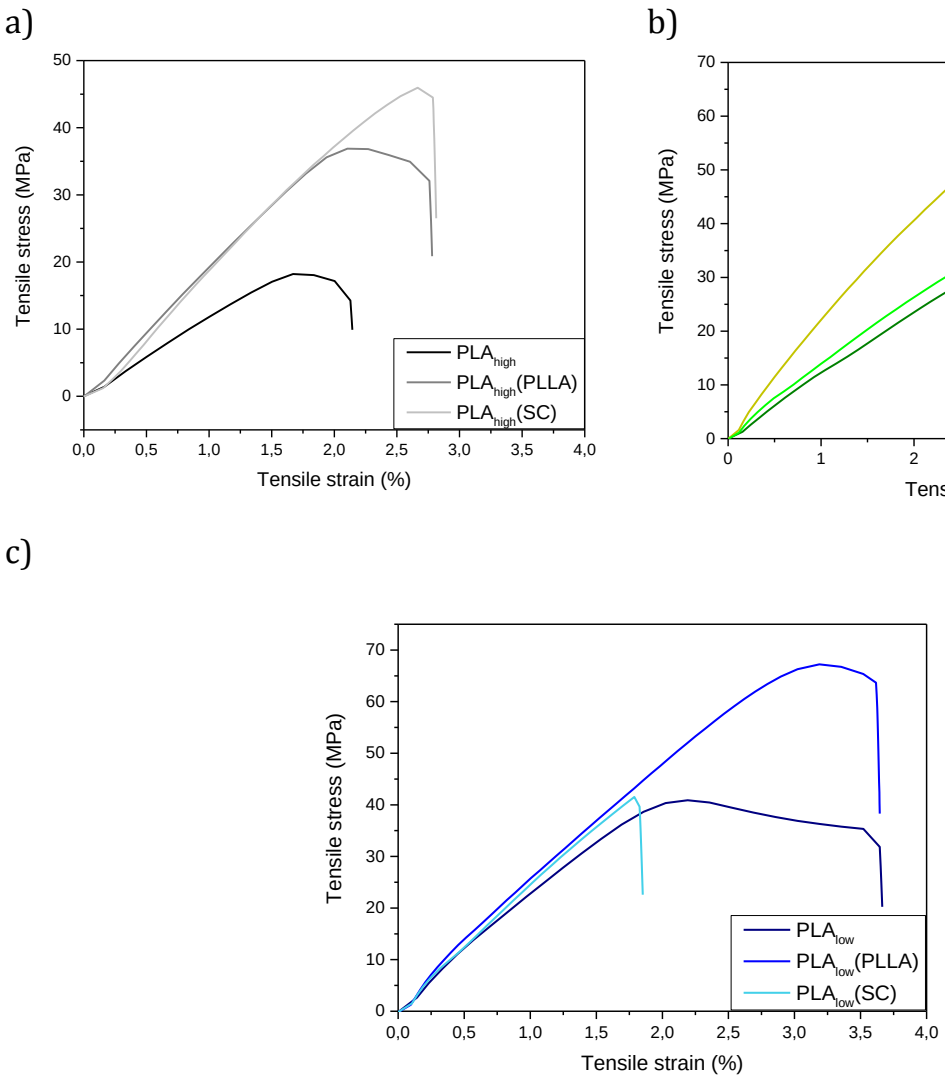
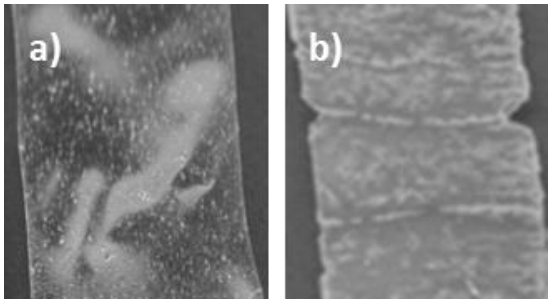


Figure S3. Representative tensile strength against tensile strain curves of the particulate-homocomposite materials: a) PLA_{high}-based homocomposites, b) PLA_{med}-based homocomposites and c) PLA_{low}-based homocomposites.

Effect of particle loading



FigureS4. Particulate-homocomposites films at different SC particle loading: a) PLA_{high}(SC) with 5 wt% particle loading and b) PLA_{high}(SC) with 10 wt% particle loading.

Particles thermal properties

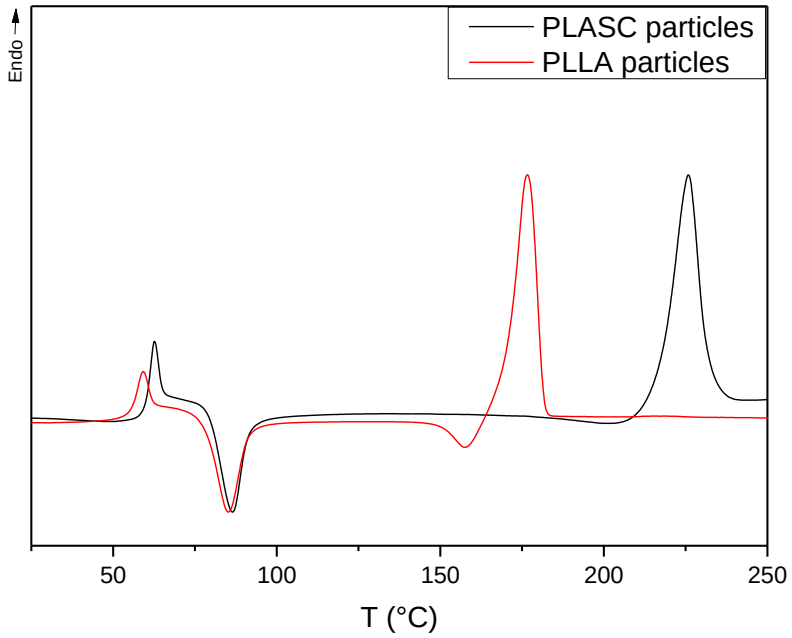


Figure S5. DSC thermograms of the 1st heating scan of the PLLA and PLASC particles used as fillers.