

Blending PHBV with P(3HB-co-4HB) for Superior Thermal Stability, Mechanical Strength, and Environmental Degradation

Ana Carolina Lemos de Morais,^{a,b} Allef Gabriel Fortes da Silva,^b Iago Rodrigues de Abreu,^b Corinne van Noordenne-Bos,^b Vincent S. D. Voet,^b Rudy Folkersma,^b Katja Loos^{a,*}

Supplementary information

Table S1. Mechanical properties of PHBV, PX, and their blends produced by extrusion.

	Tensile Strain (MPa)	Young's Modulus (MPa)	Elongation at break (%)	Impact resistance (KJ/m ²)	Types of impact failure
PX	16 (±0.1) ^a	590 (±30.2) ^g	20.0 (±2.1) ^a	106.4 (±9.2) ^a	Complete fracture
PHBV	42.9 (±0.2) ^b	4670 (±115) ^a	1.2(±0.0) ^b	5.4(±0.1) ^d	Complete fracture
PHBV_10PX	39.3 (±0.4) ^c	4230 (±28.6) ^b	1.5 (±0.0) ^b	5.9(±0.1) ^d	Complete fracture
PHBV_20PX	36.3 (±0.4) ^d	3460 (±38.3) ^c	1.8 (±0.0) ^b	6.2(±0.1) ^d	Complete fracture
PHBV_30PX	34.7 (±0.4) ^e	2990 (±14.8) ^d	2.4 (±0.1) ^b	7.5(±0.1) ^d	Complete fracture
PHBV_40PX	31.5 (±0.1) ^f	2580 (±15.1) ^e	3.2 (±0.1) ^b	13.9(±1.0) ^c	Complete fracture
PHBV_50PX	28.6 (±0.1) ^g	2200 (±23.4) ^f	3.9 (±0.1) ^b	25.4(±0.6) ^b	Complete fracture

a, b, c, d, f, g Different letters indicate a group of significant differences ($p > 0.05$) between the means according to Tukey's test.

Table S2. Values for weight loss (%) over time for PHBV, PX, and their blends for soil degradation.

Time	PHBV	PX	PHBV_10PX	PHBV_20PX	PHBV_30PX	PHBV_40PX	PHBV_50PX
1 WEEK	0.5% ± 0.07	0.9% ± 0.2	0.1% ± 0.1	0.4% ± 0.1	0.7% ± 0.4	0.8% ± 0.3	0.5% ± 0.3
2 WEEK	6.8% ± 0.9	13% ± 1.6	3% ± 0.5	3% ± 0.3	6% ± 1.3	8% ± 1.3	8% ± 0.7
4 WEEK	24% ± 6.1	40% ± 4.6	15% ± 1.3	17% ± 4	18% ± 1.6	31% ± 5	28% ± 5.6
6 WEEK	36% ± 8	40% ± 9.3	26% ± 3.4	26% ± 4	33% ± 4.8	45% ± 5.4	44% ± 3.2
8 WEEK	49% ± 13	89% ± 2	32% ± 8.9	44% ± 7	46% ± 2.8	52% ± 7.6	57% ± 10.4
10 WEEK	63% ± 9.4	98% ± 0.4	34% ± 4.5	57% ± 10	55% ± 7.3	63% ± 7.8	60% ± 2.4
12 WEEK	75% ± 7.3	100%	62% ± 2.3	59% ± 7	83% ± 6	75% ± 6	80% ± 8.1
14 WEEK	95% ± 2.7	100%	67% ± 5.4	90% ± 3	84% ± 5.	89% ± 11	97% ± 3
16 WEEK	96% ± 1	100%	83% ± 8	77% ± 5	69% ± 13	83% ± 9	97% ± 5.4