Electronic Supplementary Material (ESI) for RSC Advances.


**Electronic Supplementary Information**

# Tuning the Compatibility to achieve Toughened Biobased Poly(lactic acid)/Poly(butylene terephthalate) Blends

Boon Peng Chang[a,], Amar K. Mohanty*[a,b,] and Manjusri Misra[a,b]

[a]Bioproducts Discovery and Development Centre, Department of Plant Agriculture, Crop Science Building, University of Guelph, 50 Stone Road East, Guelph, ON N1G 2W1, Canada.

[b]School of Engineering, Thornbrough Building, University of Guelph, 50 Stone Road East, Guelph, ON N1G 2W1, Canada.

**Supporting Document (S1)**

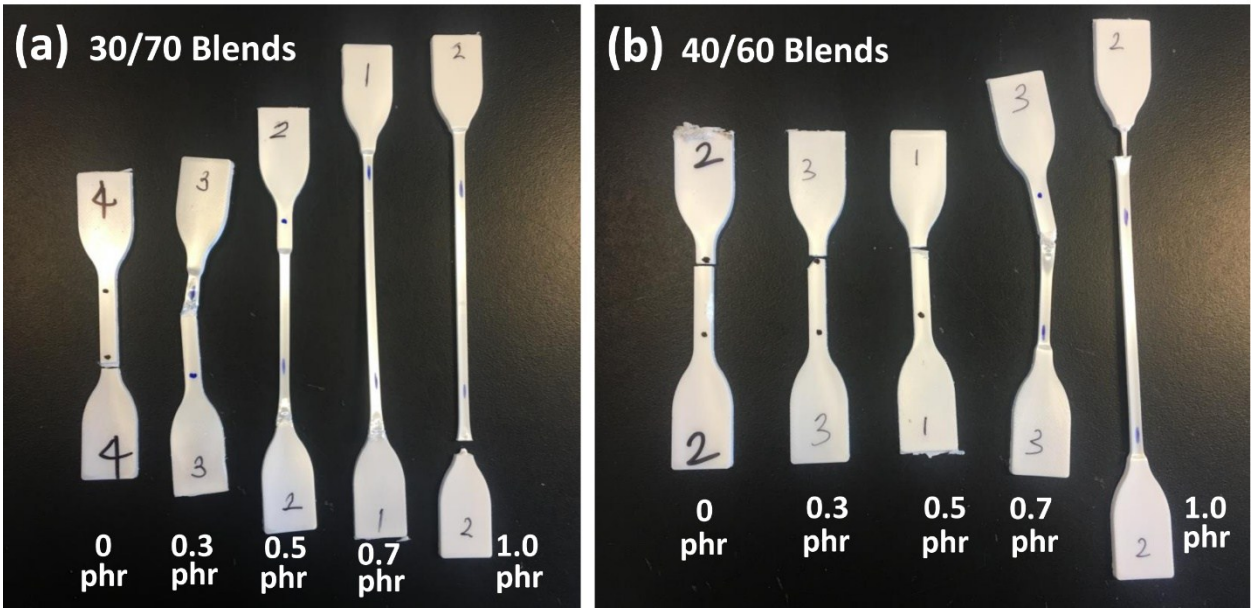


**Fig. S1.** Digital photographs of the development of necking propagation on the tensile fractured of the PLA/PBT blends at different content of the ESAC, (a) 30/70 and (b) 40/60 PLA/PBT blends.

**Supporting Document (S2)**

**Thermogravimetric Analysis (TGA).**

Thermogravimetric analysis (TGA) of the PLA/PBT blends was performed using a TGA Q500 from TA-Instruments, USA, under nitrogen atmosphere. The samples weights with approximately 10-13 mg were ramp heated from 30ºC to 700ºC with a heating rate of 10°C/min. Both TGA and derivatives of the TGA curves (DTG) were obtained from TA analysis software.

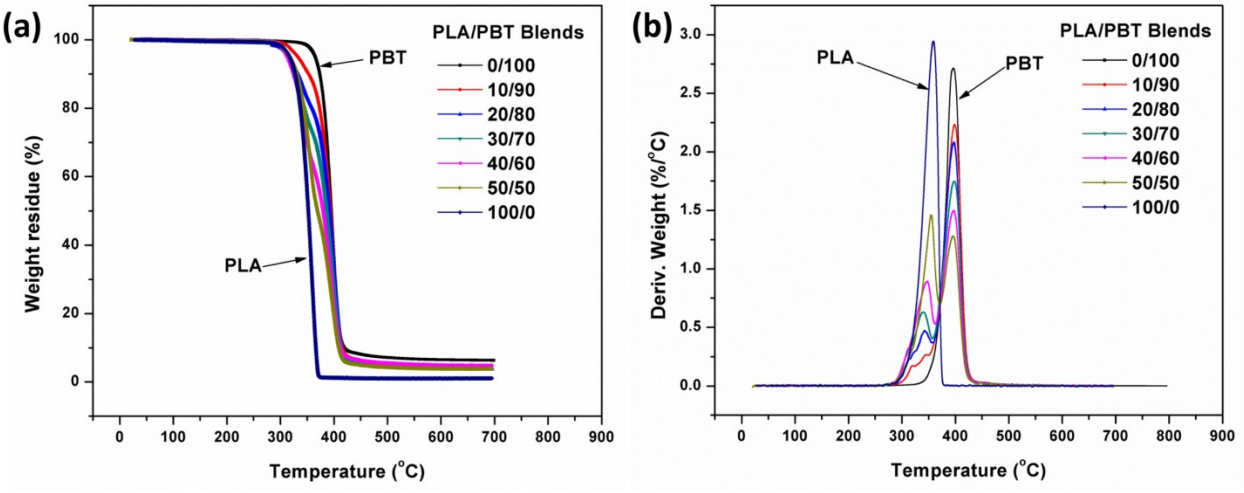


**Fig. S2.** (a) Thermal degradation curves and (b) DTG curves for different ratio of PLA/PBT blends.

**Supporting Document (S3)**

**Heat deflection temperature measurement**

The heat deflection temperature (HDT) measurement was carried out using dynamic mechanical analysis (DMA) Q800 from TA-Instruments, USA. The sample dimension with 50 mm x 12 mm x 3 mm (*length* x *width* x *thickness*) was setup in 3-point bending clamp mode in the device under the stress of 0.455 MPa. The samples were heated from 30 ºC to 200 ºC with a heating rate of 2 °C/min according to ASTM D648. The heat deflection temperature was recorded at the deflection changes of samples more than 250 µm.

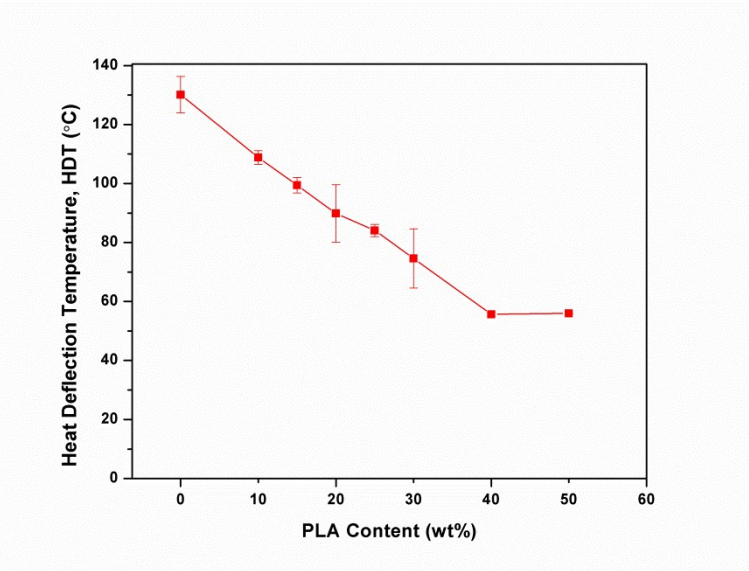


**Fig. S3.** The heat deflection temperature for PLA/PBT blends with different content of PLA.

From Fig. S3, it can be seen that the HDT of pure PBT is approximately 130°C. The PLA/PBT blends decreases gradually with the increasing content of PLA in the blend. This is due to the low HDT temperature of PLA which is around 54.3°C. Therefore, the reduction in HDT of the PBT was observed after blending with PLA.