

## Balanced strength and ductility improvement of in situ crosslinked polylactide/poly(ethylene terephthalate glycol) blends

*Rui-Ying Bao, Wen-Rou Jiang, Zheng-Ying Liu, Wei Yang\*, Bang-Hu Xie, Ming-Bo Yang*

College of Polymer Science and Engineering, Sichuan University, State Key Laboratory of Polymer Materials  
Engineering, Chengdu, 610065, Sichuan, China

The thermal properties were characterized by differential scanning calorimetry (DSC) with a DSC Q20 (TA Instruments, USA) under a 50 mL min<sup>-1</sup> nitrogen gas flow. The samples were quenched to 0 °C after melting at 190 °C for 3 min, and then heated to 190 °C at a rate of 10 °C/min.

Fig. S1 shows DSC heating curves of quenched PLA-MDI and PLA-MDI/PETG samples, and the data are summarized in Table S1. As shown in Fig. S1(a), with the content of MDI increasing, the cold crystallization temperature ( $T_{cc}$ ) increases and the melting enthalpy ( $\Delta H_m$ ) decreases, indicating a decrease in crystallization ability of PLA owing to the crosslinking of PLA chains. As shown in Fig. S1(b), after the addition of PETG into PLA and PLA-MDI,  $T_{cc}$  shifts to higher temperature than that of neat PLA and corresponding PLA-MDI. With the content of MDI increasing,  $T_{cc}$  increases, and the normalized melting enthalpy ( $\Delta H_m'$ ) reduces. Except for the crosslinking of PLA chains, the chemical bonding between PLA and PETG prevents PLA molecules from stepping into the crystal lattice of PLA. The melting peak decreased gradually with increasing content of MDI and completely disappears in PLA-5MDI/PETG, indicating that blends has finally transformed into an amorphous network when the crosslink density is high.

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\* Corresponding author. Tel.: + 86 28 8546 0130; fax: + 86 28 8546 0130.

*E-mail address:* [weiyang@scu.edu.cn](mailto:weiyang@scu.edu.cn) (W Yang)

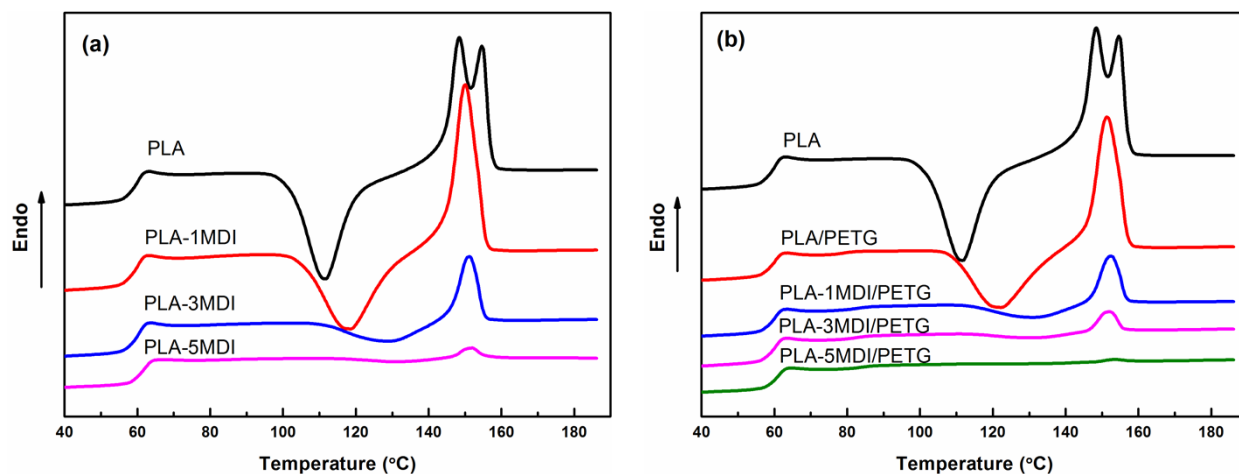


Fig. S1 DSC heating curves of quenched (a) PLA-MDI, and (b) PLA-MDI/PETG samples.

Table S1. DSC parameters from heating scan of quenched PLA-MDI and PLA-MDI/PETG samples.

	$T_{cc}$	$T_m$	$\Delta H_m$		$T_{cc}$	$T_m$	$\Delta H_m$	$\Delta H_m'$
	$^{\circ}C$	$^{\circ}C$	J/g		$^{\circ}C$	$^{\circ}C$	J/g	J/g
PLA	111.6	148.4	27.3	PLA/PETG	122.3	151.4	20.6	25.7
PLA-1MDI	118.5	150.0	25.5	PLA-1MDI/PETG	131.2	152.5	6.1	7.6
PLA-3MDI	128.9	151.1	8.3	PLA-3MDI/PETG	131.6	152.1	2.5	3.1
PLA-5MDI	131.5	152.1	1.2	PLA-5MDI/PETG	—	—	—	—