

Effect of Few-Layer Graphene on the Properties of Mixed Polyolefin Waste Stream

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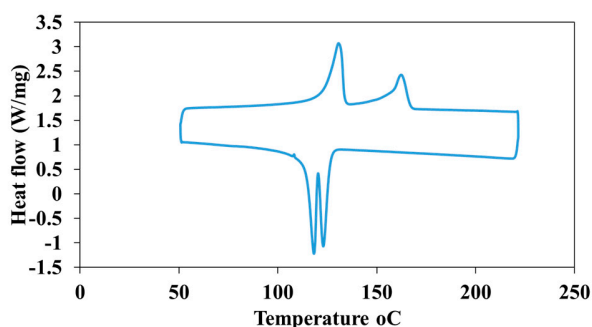
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Differential scanning calorimetry (DSC) analysis

Figure S1 shows the differential scanning calorimetry (DSC) analysis of the mixed polyolefin waste stream (R-PE/PP).



Properties	No Extrusion	
	PE	PP
Crystallization temperature (°C)	118	122.9
Melting temperature (°C)	130.5	162.2
Melt enthalpy (J/g)	53.4	37.5

Figure S1: DSC analysis of unfilled R-(PE/PP)

The area under the melt peak (melting enthalpy, ΔH_m) of the components and blend compositions are linearly correlated in DSC analysis of semi-crystalline polymer blends [1]. However, this method cannot be directly used to quantify the polyethylene (PE)/ polypropylene (PP) composition in recycled blends as the PE and PP grades are not identified. Nevertheless, this approach can be adopted to estimate the composition of mixed polyolefin waste stream. According to this approach and the respective melt enthalpy values (depicted from Figure S1) of PE and PP indicate that PE constitutes 59 wt.% of the blend.

Melt flow index (MFI) of Type 1 and Type 3 composites

Figure S2a shows the MFI results of Type 1 composites (comprised of R-(PE/PP) and FLG) as a function of the concentration of FLG, and Figure S2b presents the MFI values of Type 3 composites (comprised of R-(PE/PP), FLG and prime polymer) as a function of the type of the prime polymer.

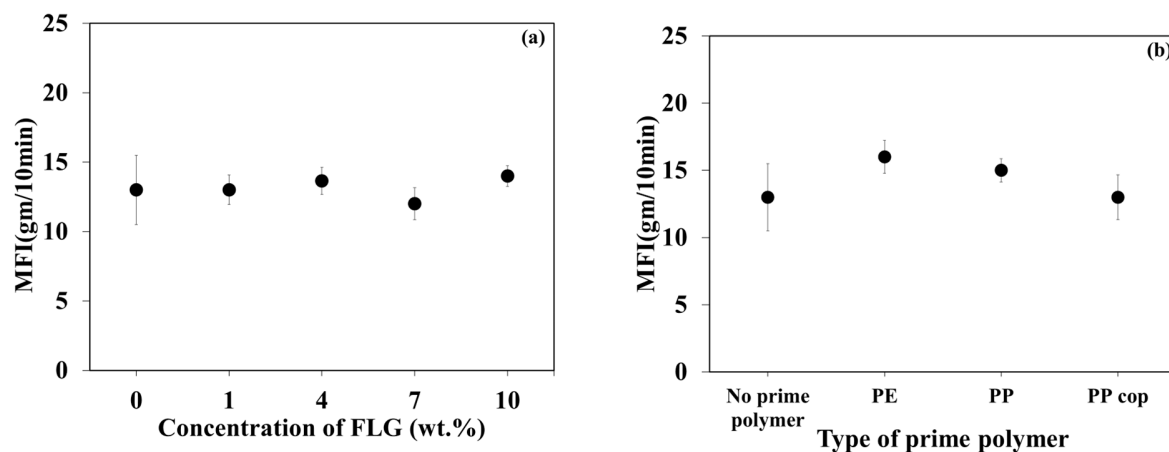


Figure S2. MFI of (a) R-(PE/PP)/FLG composites as a function of the concentration of FLG and (b) R-(PE/PP)/prime polymer/FLG composites as a function of the type of prime polymer.

1. Kazemi, Y.; Kakroodi, A.R.; Rodrigue, D. Compatibilization efficiency in post-consumer recycled polyethylene/polypropylene blends: Effect of contamination. *Polym. Eng. Sci.* **2015**, *55*, 2368–2376. <https://doi.org/10.1002/pen.24125>.