Supporting Information:

Recycling Waste Polyester via Modification with a Renewable Fatty Acid for Enhanced Processability

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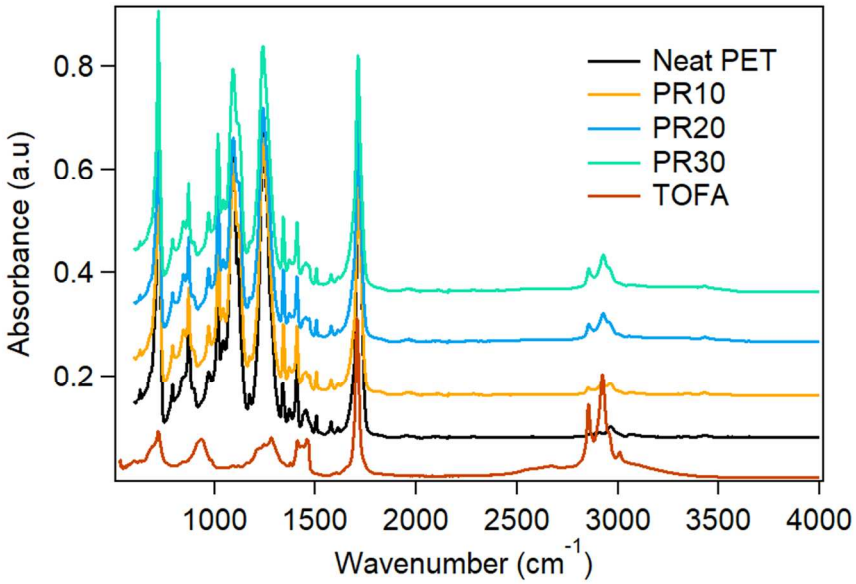

Figure S1. FTIR spectra of TOFA, neat PET and its blends with different renewable plasticizer content (from 10 wt.% to 30 wt.%).

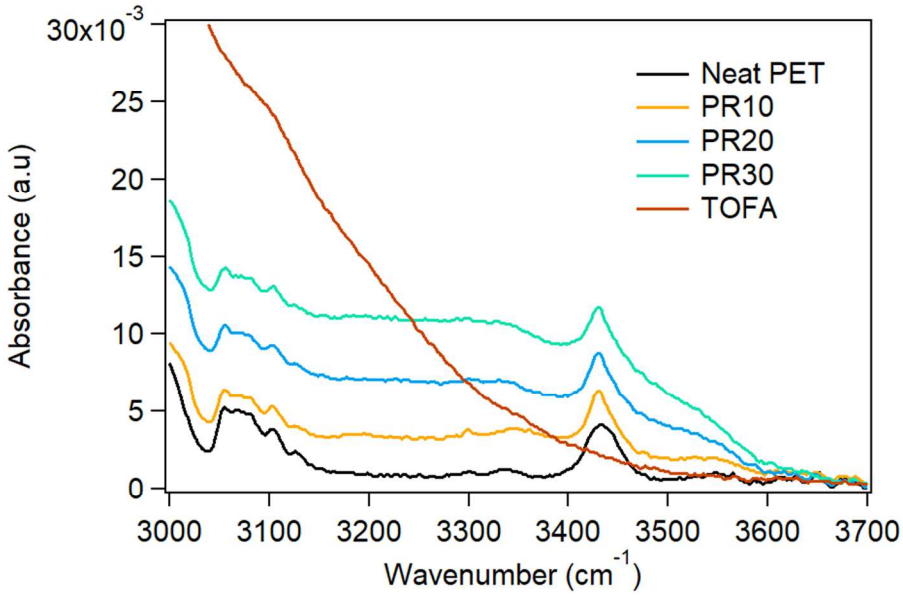

Figure S2. FTIR spectra of TOFA, neat PET and its blends with different renewable plasticizer content focused on the O-H stretching region (3300-3600 cm^{-1}).

NMR Characterization

Four samples were prepared in 1.5 mL GC/MS vials: 1) 50 mg PET; 2) 15 mg TOFA; 3) 65 mg PR30; 4) 50 mg PET plus 15 mg TOFA. HFIP-d_2 (700 microliters) was added to each vial, and the samples were allowed to dissolve overnight. $CDCl_3$ (350 microliters) was then added to each vial, the solutions well mixed, and after several hours the mixtures transferred to NMR tubes (Wilmad 527-PP). Proton and carbon Nuclear Magnetic Resonance spectra were obtained on a Varian VNMRS 500 NMR spectrometer and were recorded at 24 ºC in a 2:1 v/v mixture of hexafluoro isopropyl alcohol-d_2 (HFIP-d_2, Alfa Aesar, 98 atom %D) and $CDCl_3$. Chemical shifts were referenced to $CDCl_3$ with 7.27 ppm for ^{1}H and 77.23 ppm for ^{13}C. Carbon NMR spectra (125.667 MHz for ^{13}C) were obtained using inverse-gated decoupling with a recycle delay of 20 seconds and 3000 transients.

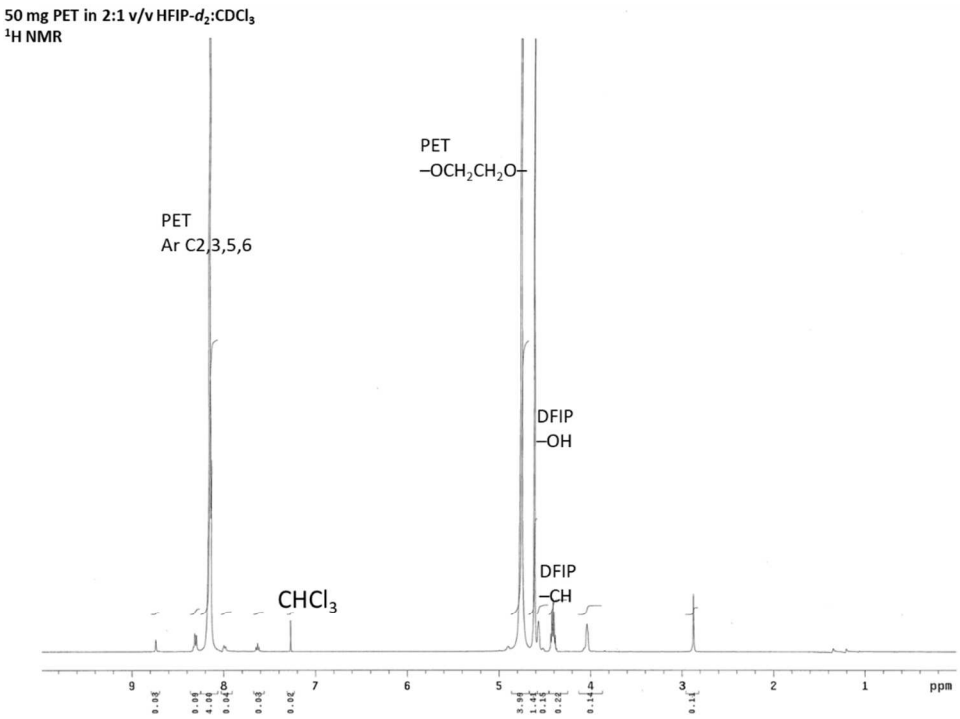

Figure S3. ^{1}H NMR spectra of PET.

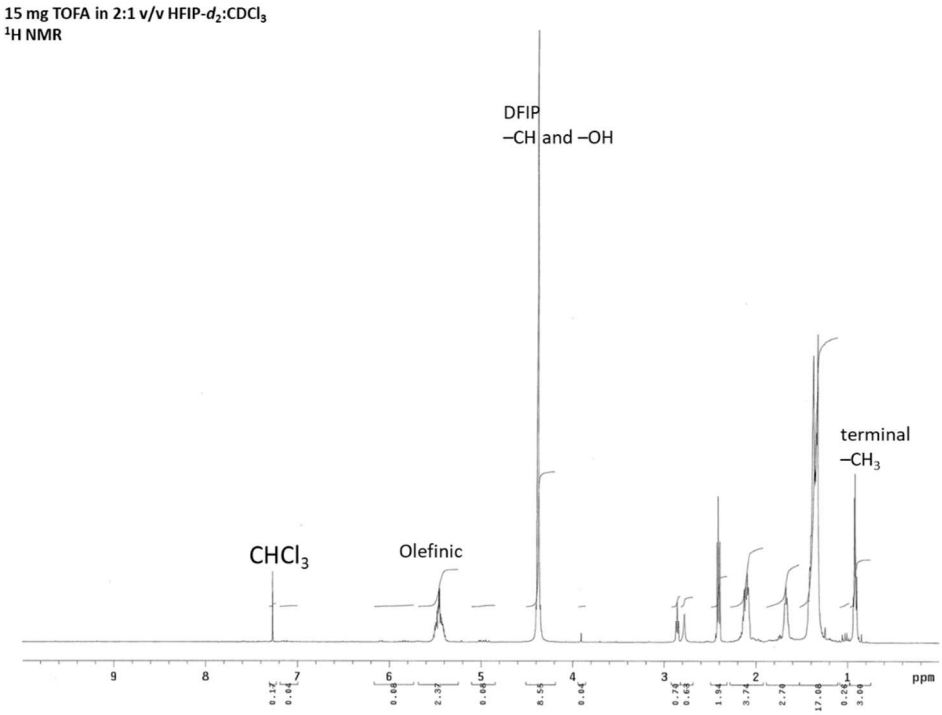

Figure S4. ^{1}H NMR spectra of TOFA.

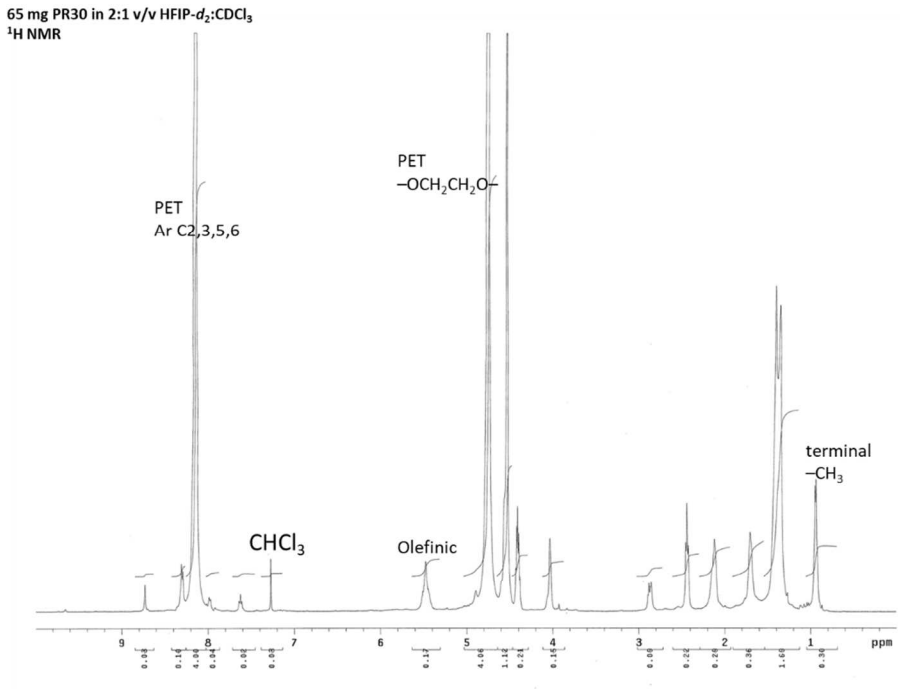

Figure S5. ^{1}H NMR spectra of PR30.

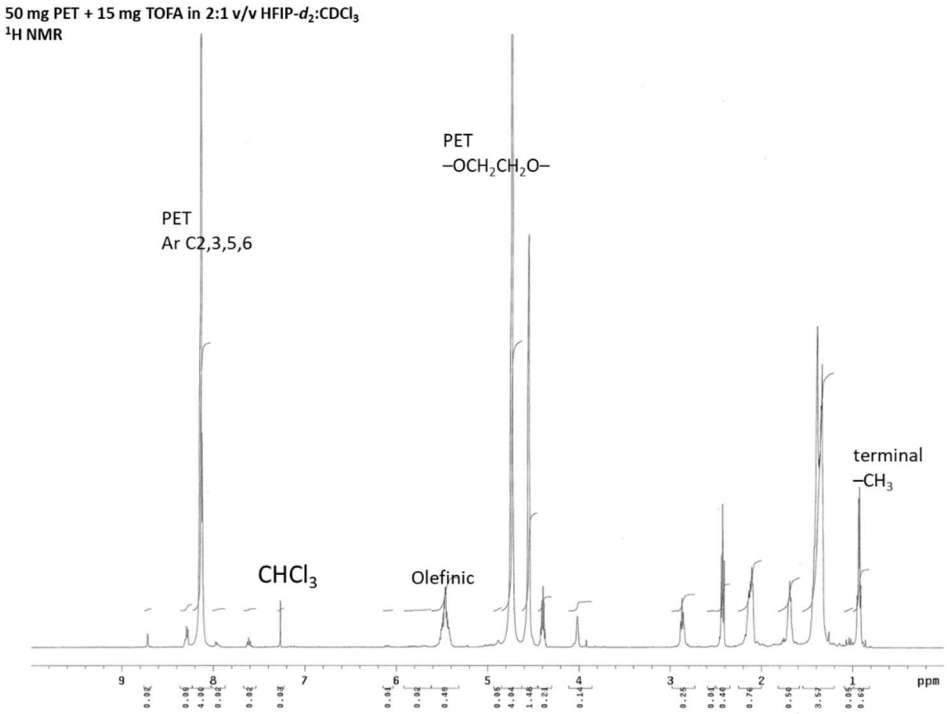

Figure S6. ^{1}H NMR spectra of hand mixed PET and TOFA at composition of 50 mg/15 mg.

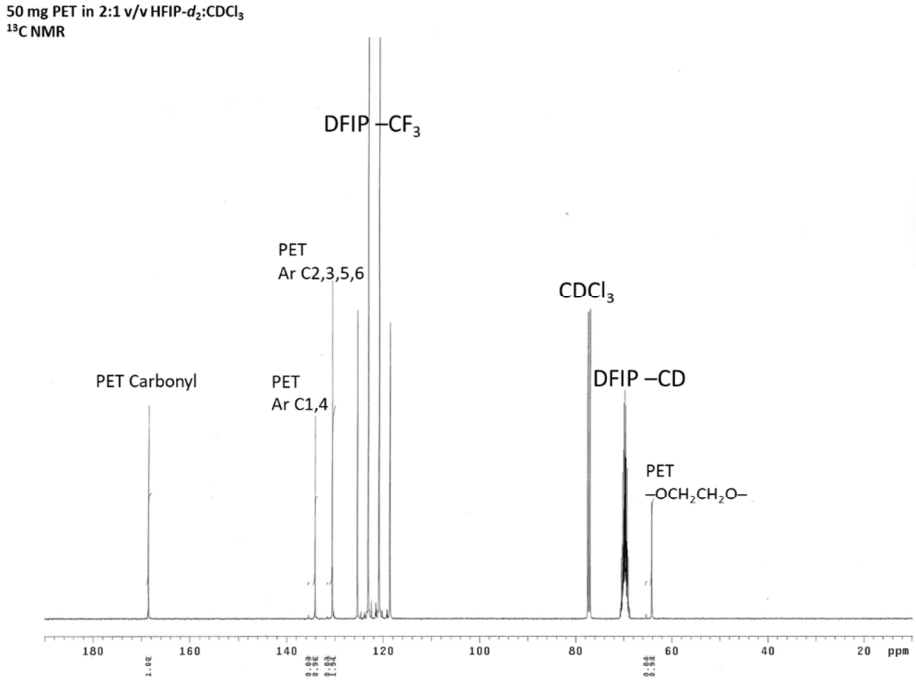

Figure S7. ^{13}C NMR spectra of PET.

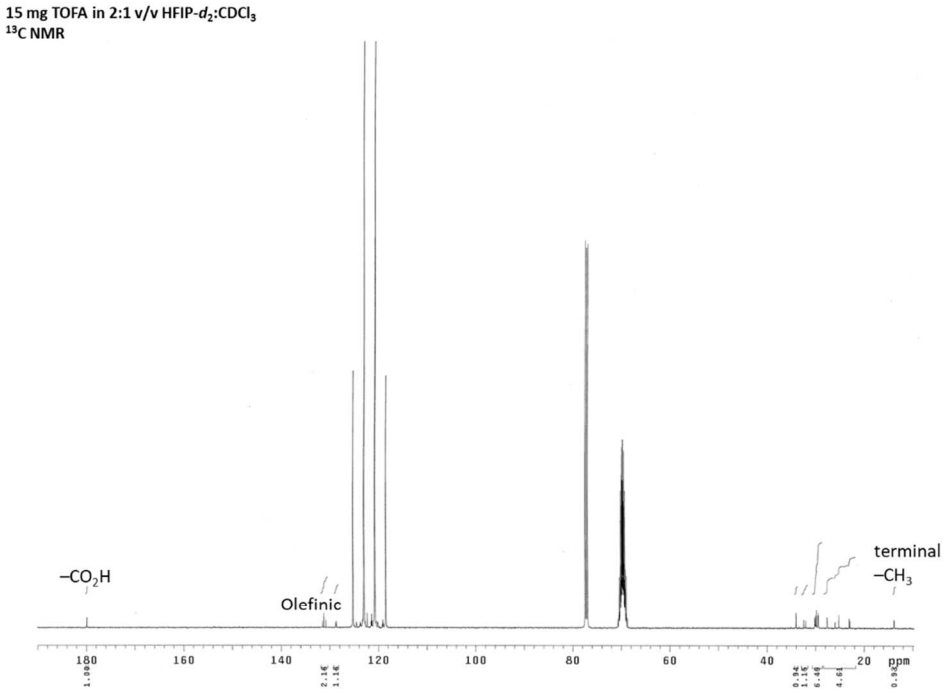

Figure S8. ^{13}C NMR spectra of TOFA.

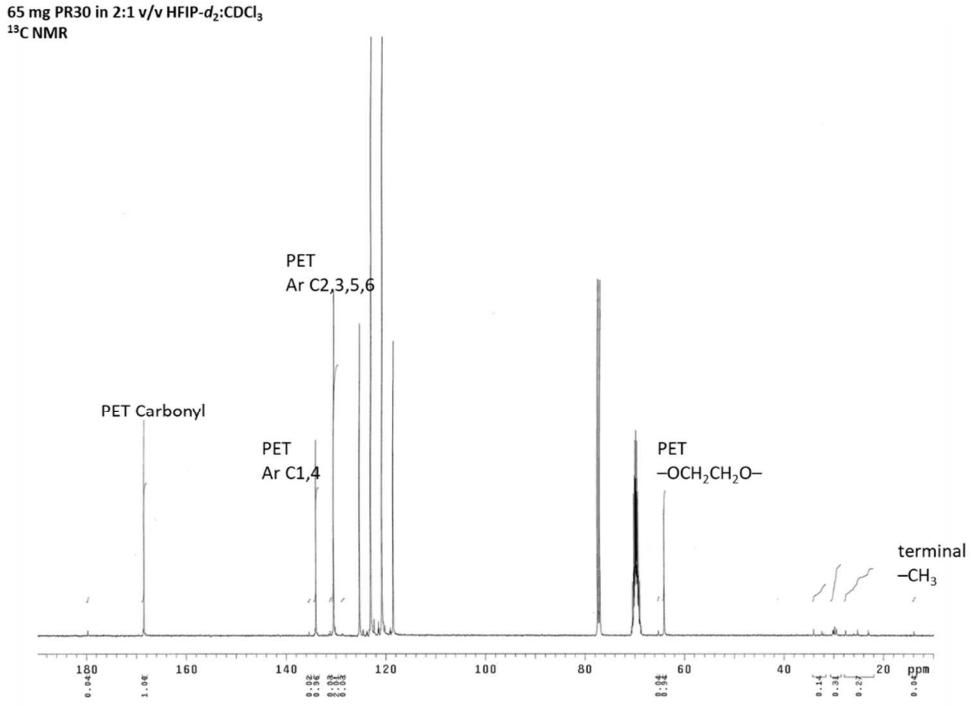

Figure S9. ^{13}C NMR spectra of PR30.

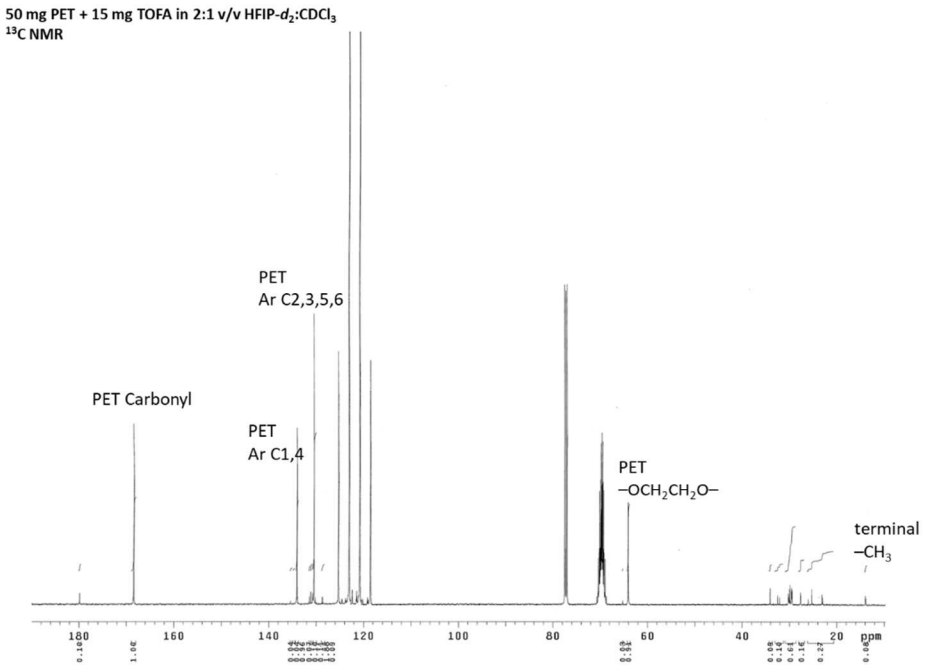

Figure S10. ^{13}C NMR spectra of hand mixed PET and TOFA at composition of 50 mg/15 mg.

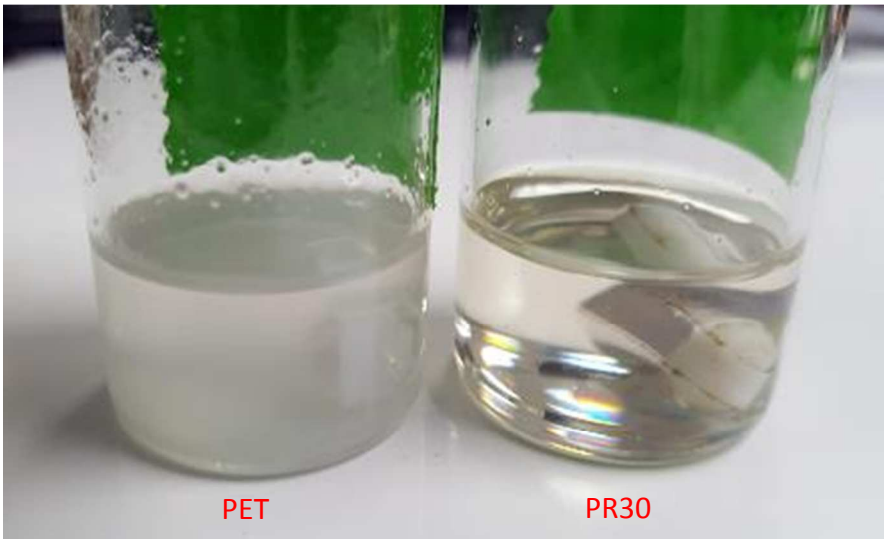

Figure S11. Solutions of PET and PR30 in 2-chlorophenol showing PET is not dissolved and PR30 fully dissolved

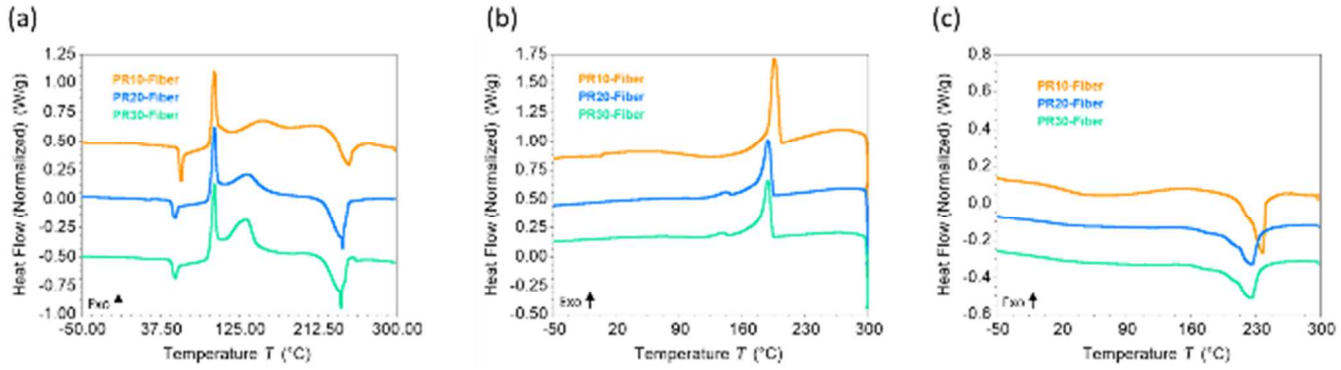

Figure S12. DSC thermograms of the fibers spun from plasticized PET matrices. (a) The first heating cycle, (b) the consequent cooling cycle, and (c) the second heating cycle indicating similar characteristics of the bulk samples