

## Supplementary Material

# Determination of the influence of multiple closed recycling loops on the property profile of different polyolefins

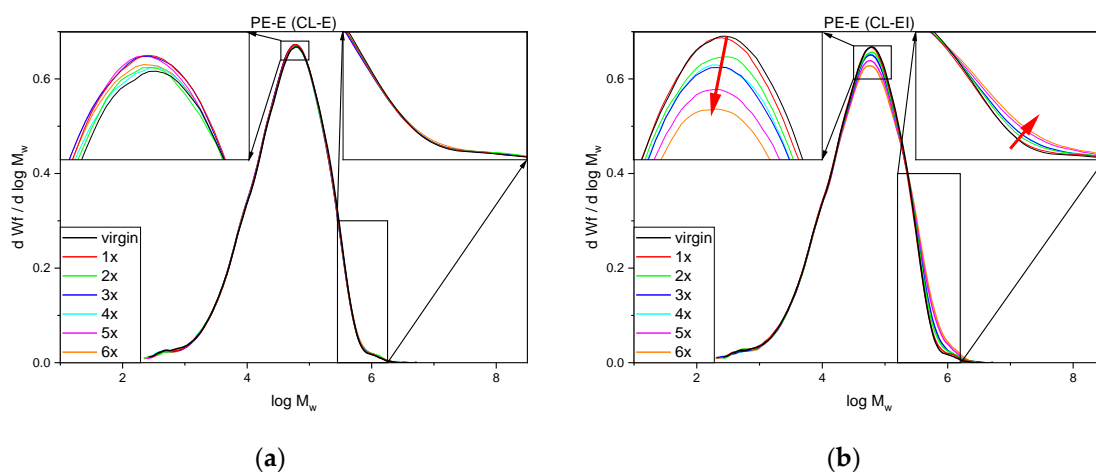
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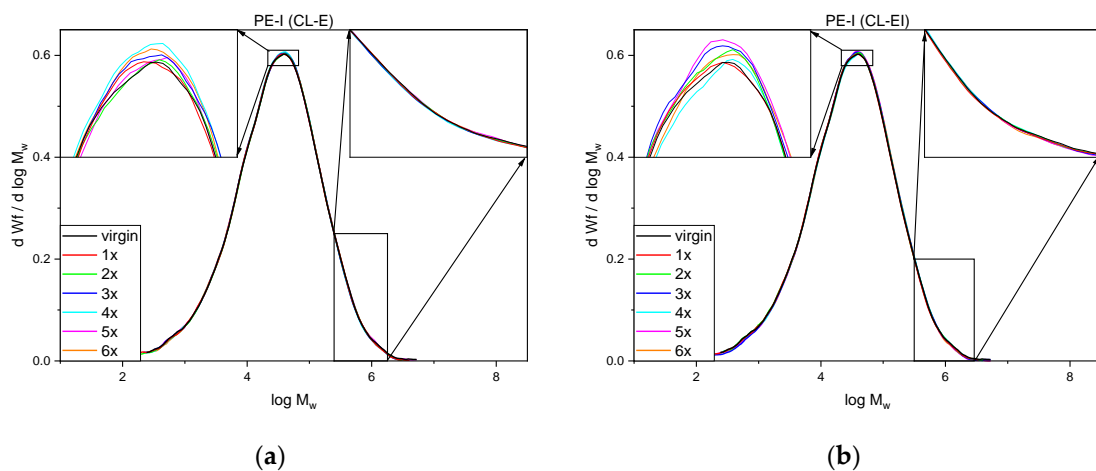
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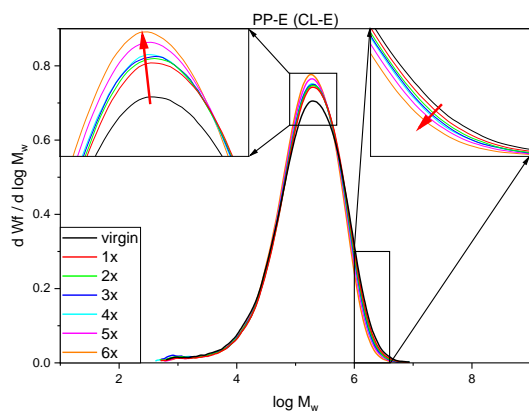
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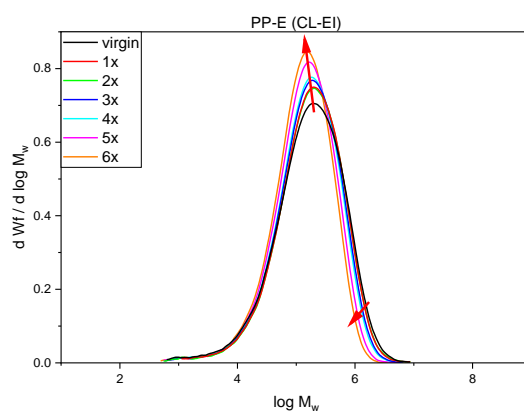
**Figure S1.** MMD of PE-E: (a) MMD after each loop of the CL-E and (b) MMD after each loop of the CL-EI.



**Figure S2.** MMD of PE-I: (a) MMD after each loop of the CL-E and (b) MMD after each loop of the CL-EI.

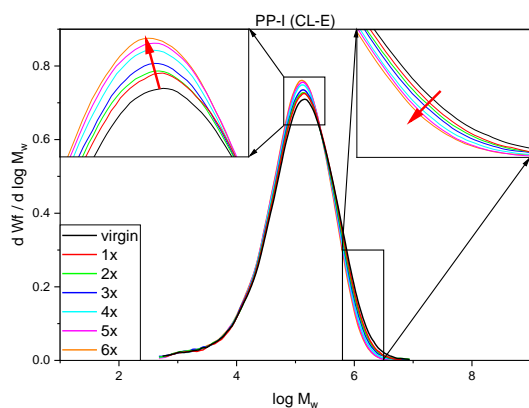


(a)

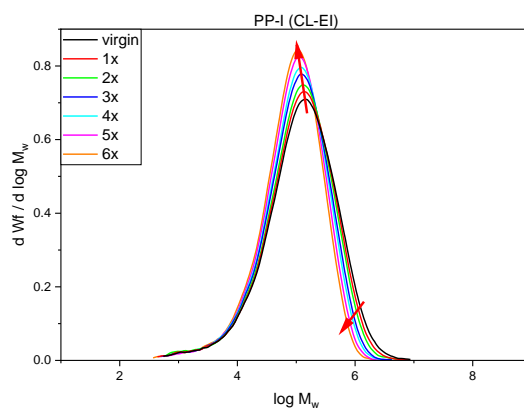


(b)

**Figure S3.** MMD of PP-E: (a) MMD after each loop of the CL-E and (b) MMD after each loop of the CL-EI.

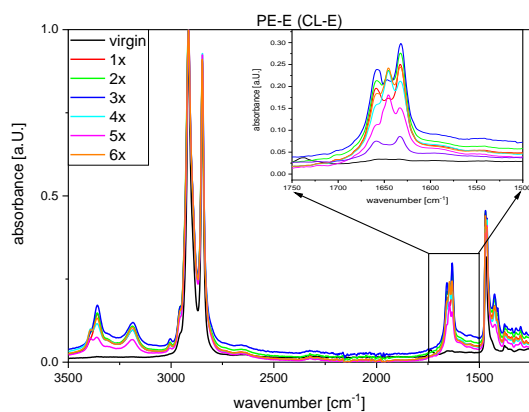


(a)

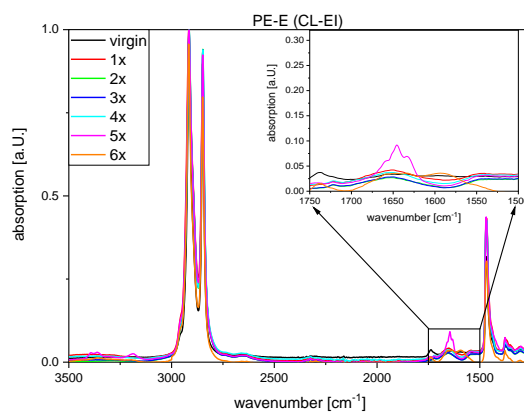


(b)

**Figure S4.** MMD of PP-I: (a) MMD after each loop of the CL-E and (b) MMD after each loop of the CL-EI.

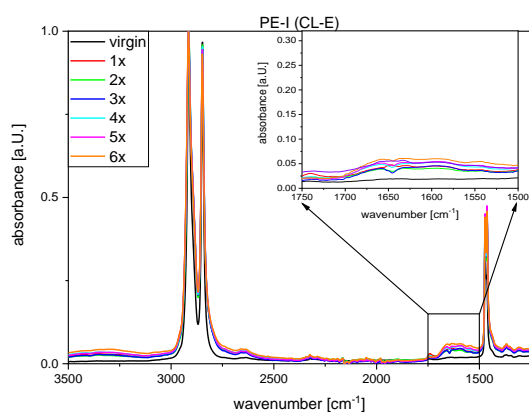


(a)

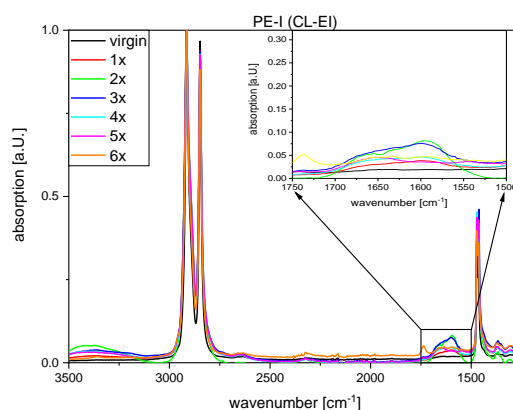


(b)

**Figure S5.** PE-E: IR absorbance spectra and enlarged spectra in the wavenumber range from 1750 to 1500  $\text{cm}^{-1}$  of the (a) CL-E and (b) CL-EI

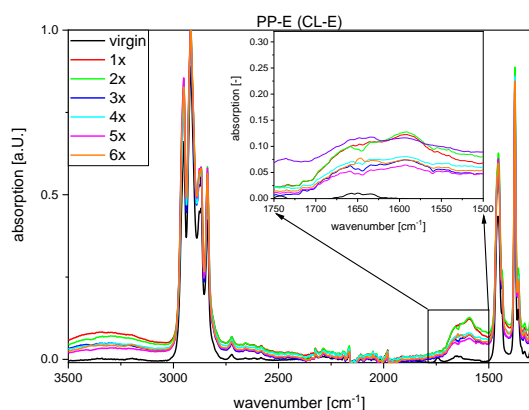


(a)

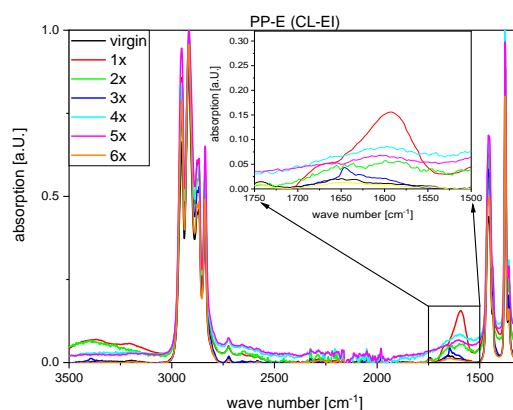


(b)

**Figure S6.** PE-I: IR absorbance spectra and enlarged spectra in the wavenumber range from 1750 to 1500  $\text{cm}^{-1}$  of the (a) CL-E and (b) CL-EI

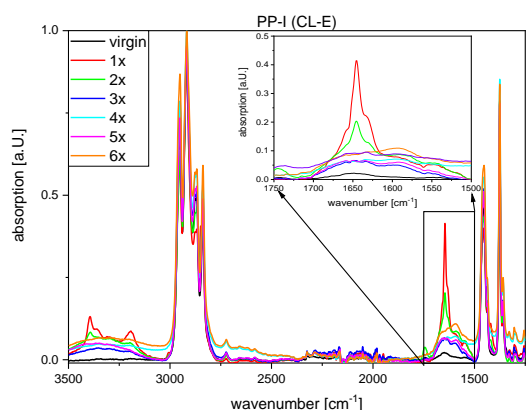


(a)

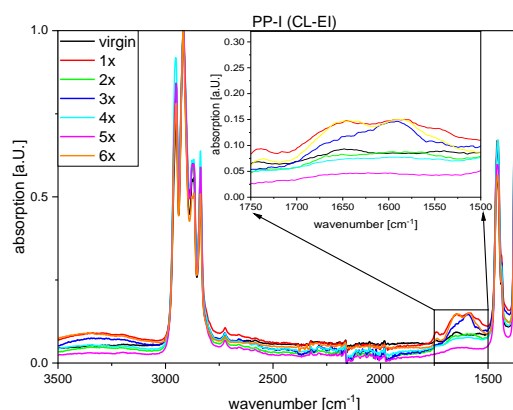


(b)

**Figure S7.** PP-E: IR absorbance spectra and enlarged spectra in the wavenumber range from 1750 to 1500  $\text{cm}^{-1}$  of the (a) CL-E and (b) CL-EI

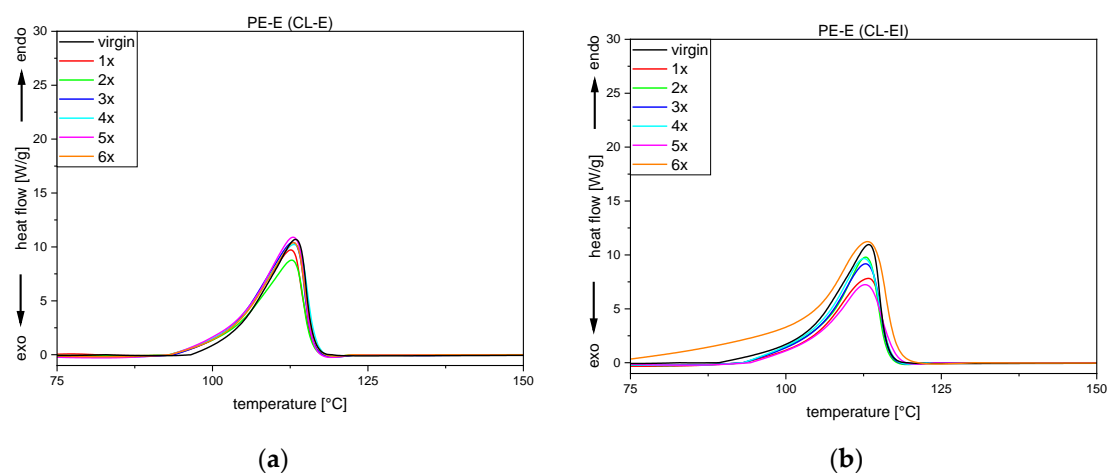


(a)

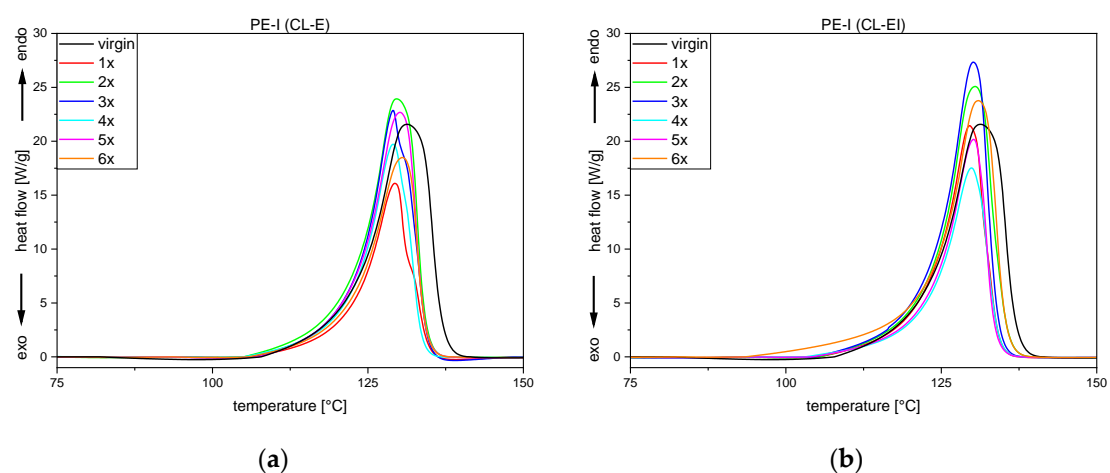


(b)

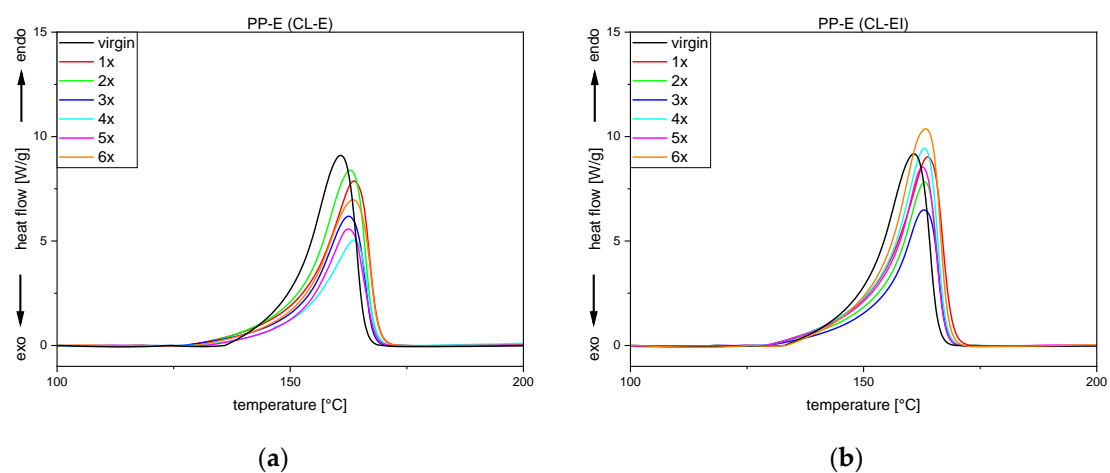
**Figure S8.** PP-I: IR absorbance spectra and enlarged spectra in the wavenumber range from 1750 to 1500  $\text{cm}^{-1}$  of the (a) CL-E and (b) CL-EI



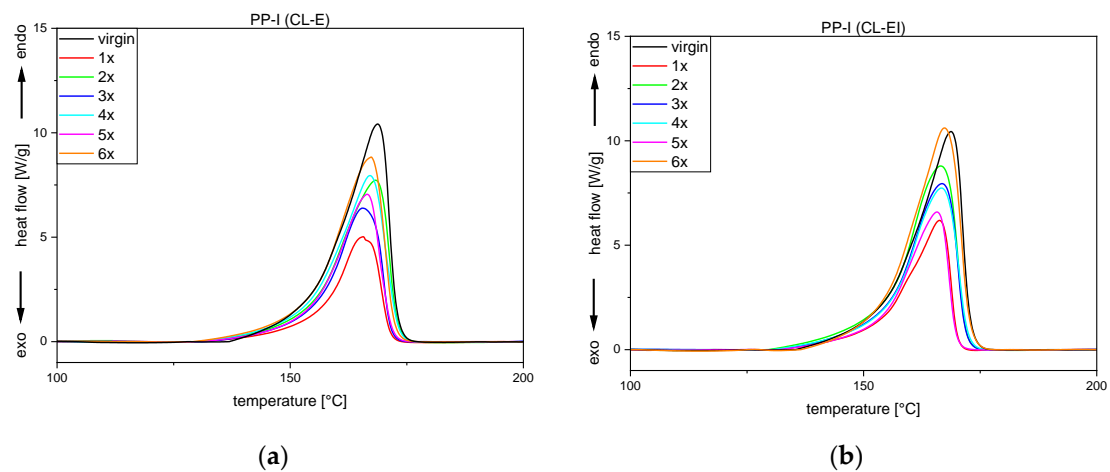
**Figure S9.** Melting peaks of the PE-E after each loop for (a) CL-E and (b) CL-EI.



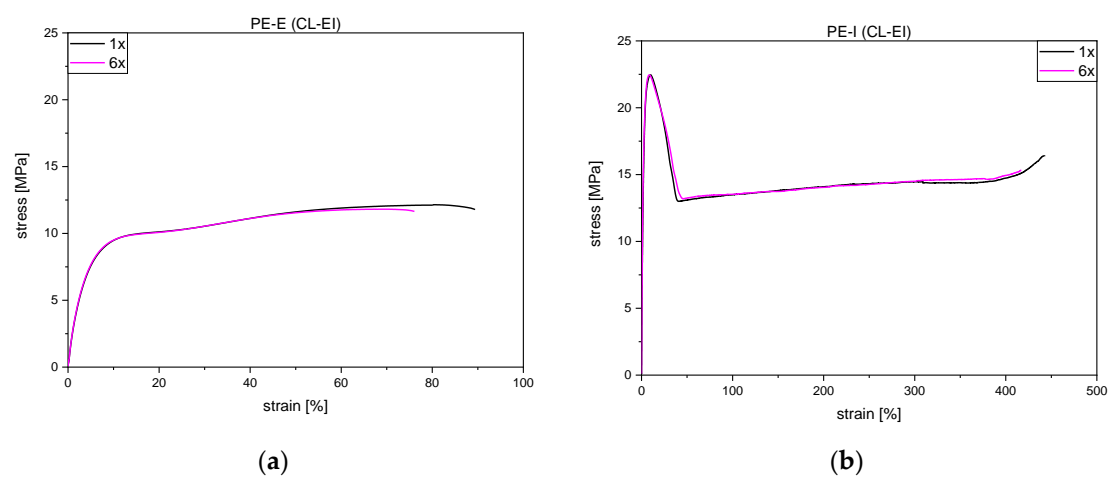
**Figure S10.** Melting peaks of the PE-I after each loop for (a) CL-E and (b) CL-EI.



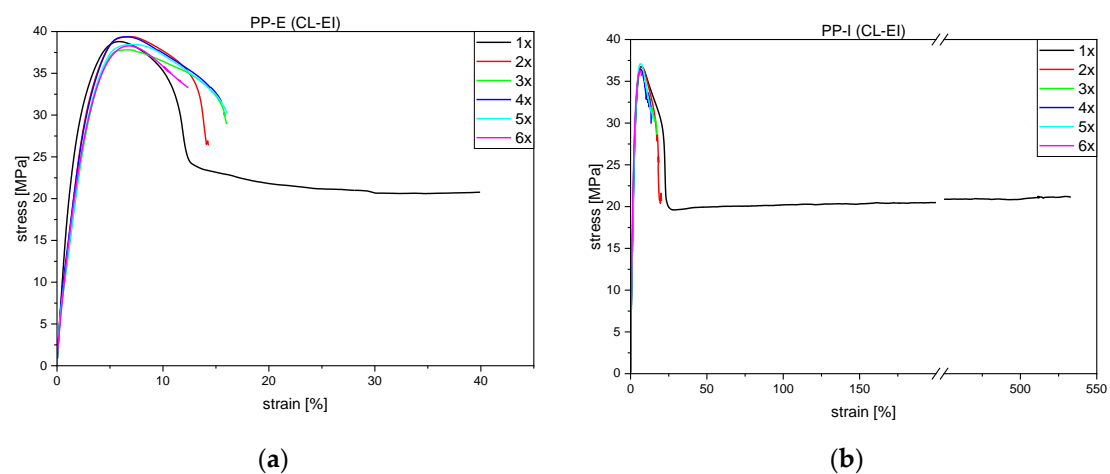
**Figure S11.** Melting peaks of the PP-E after each loop for (a) CL-E and (b) CL-EI.



**Figure S12.** Melting peaks of the PP-I after each loop for (a) CL-E and (b) CL-EI.



**Figure S13.** Melting peaks of the PP-I after each loop for (a) CL-E and (b) CL-EI.



**Figure S14.** Melting peaks of the PP-I after each loop for (a) CL-E and (b) CL-EI.