Supplementary Information for Closed-Loop Chemical Recycling of Polyethylene Furan-2,5-dicarboxylate (PEF) under Microwave-Assisted Heating

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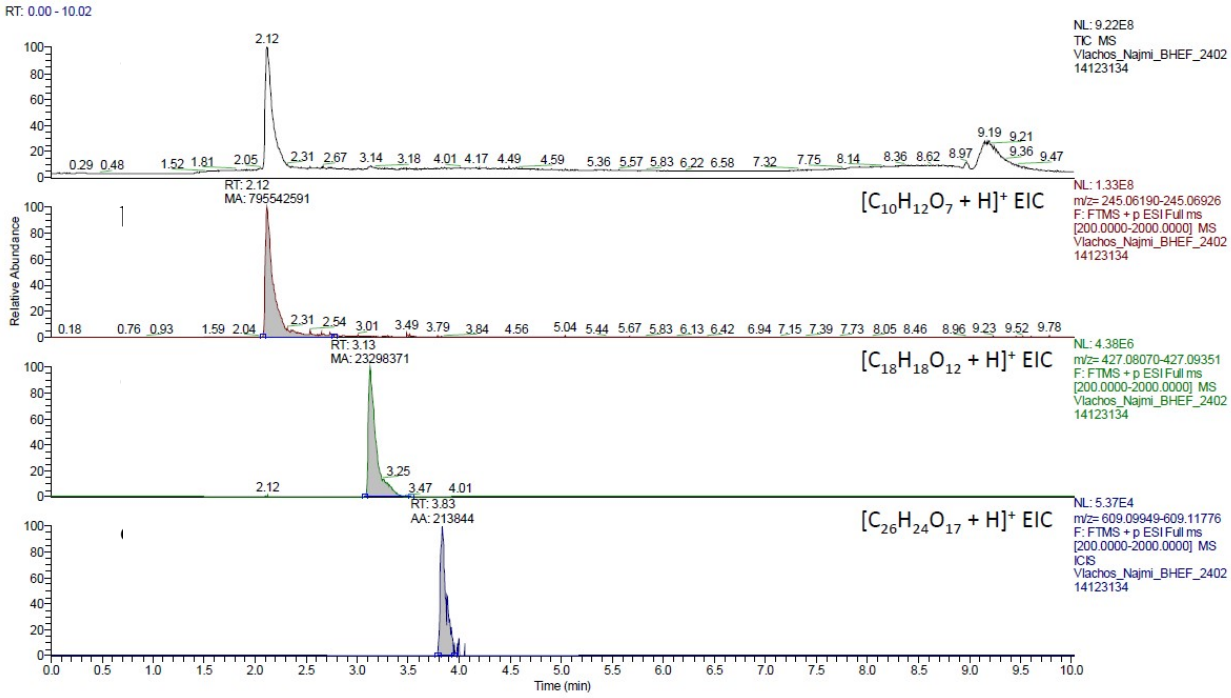

Figure S1. Total ion chromatogram of product solution PEF glycolysis (a). Chromatogram of monomer (m/z=245) (b), dimer (m/z=427) (c), and trimer (m/z = 609) (d).

Table S1. Summary of glass transition temperatures of polymer samples before and after glycolysis reaction.

Lot	T_g Before (°C)	T_g After (°C)
Lot 1	85	47
Lot 2	82	40
Lot 3	89	56
Lot 4	81	54
Lot 5	88	50
PET 1	77	56
PET 2	77	58

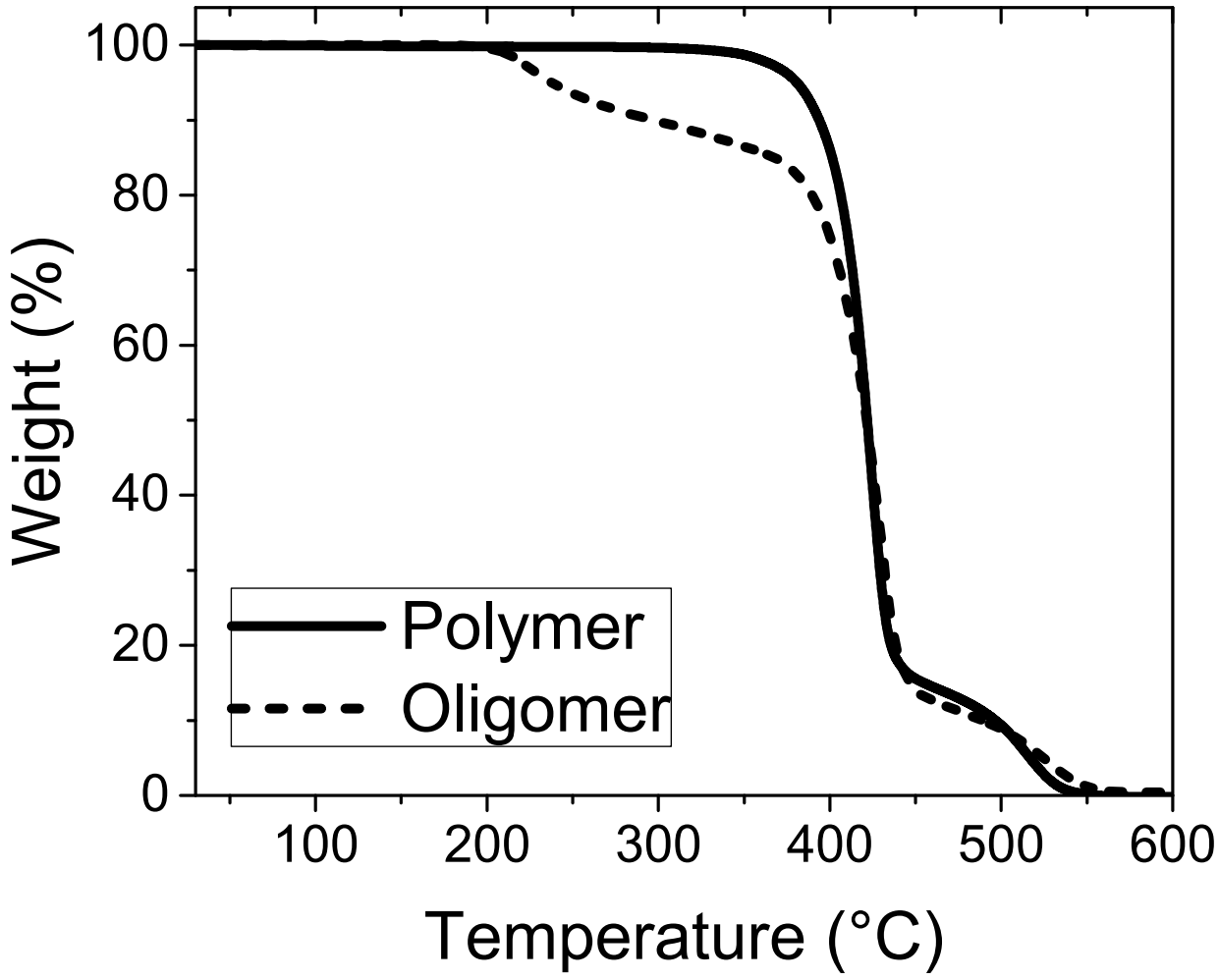

Figure S2. TGA profile of PEF oligomer and polymer taken in 40 sccm air.

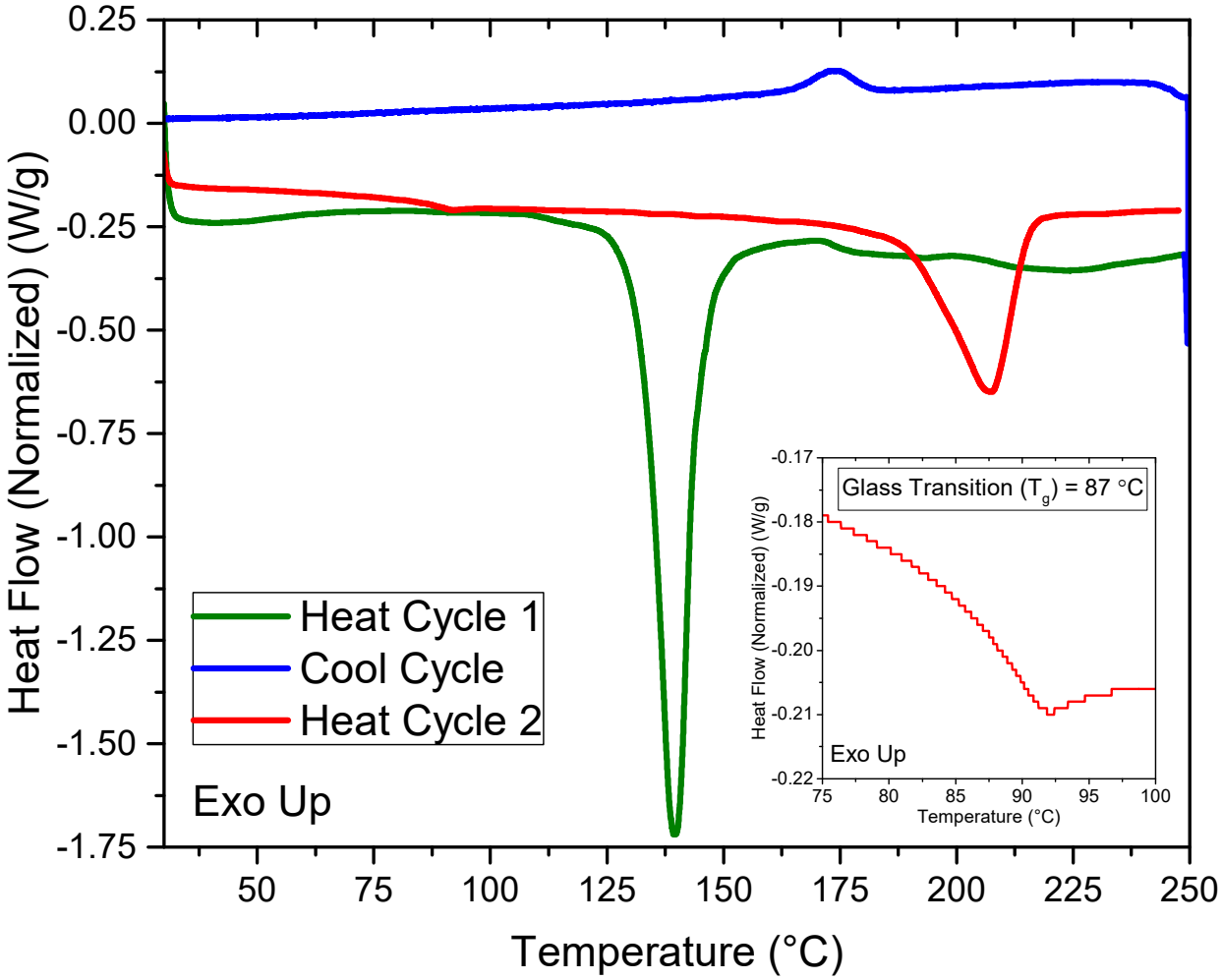

Figure S3. DSC heat-cool-heat cycle of PEF oligomers. The inset shows the zoomed-in step of the glass transition during the second heating cycle.

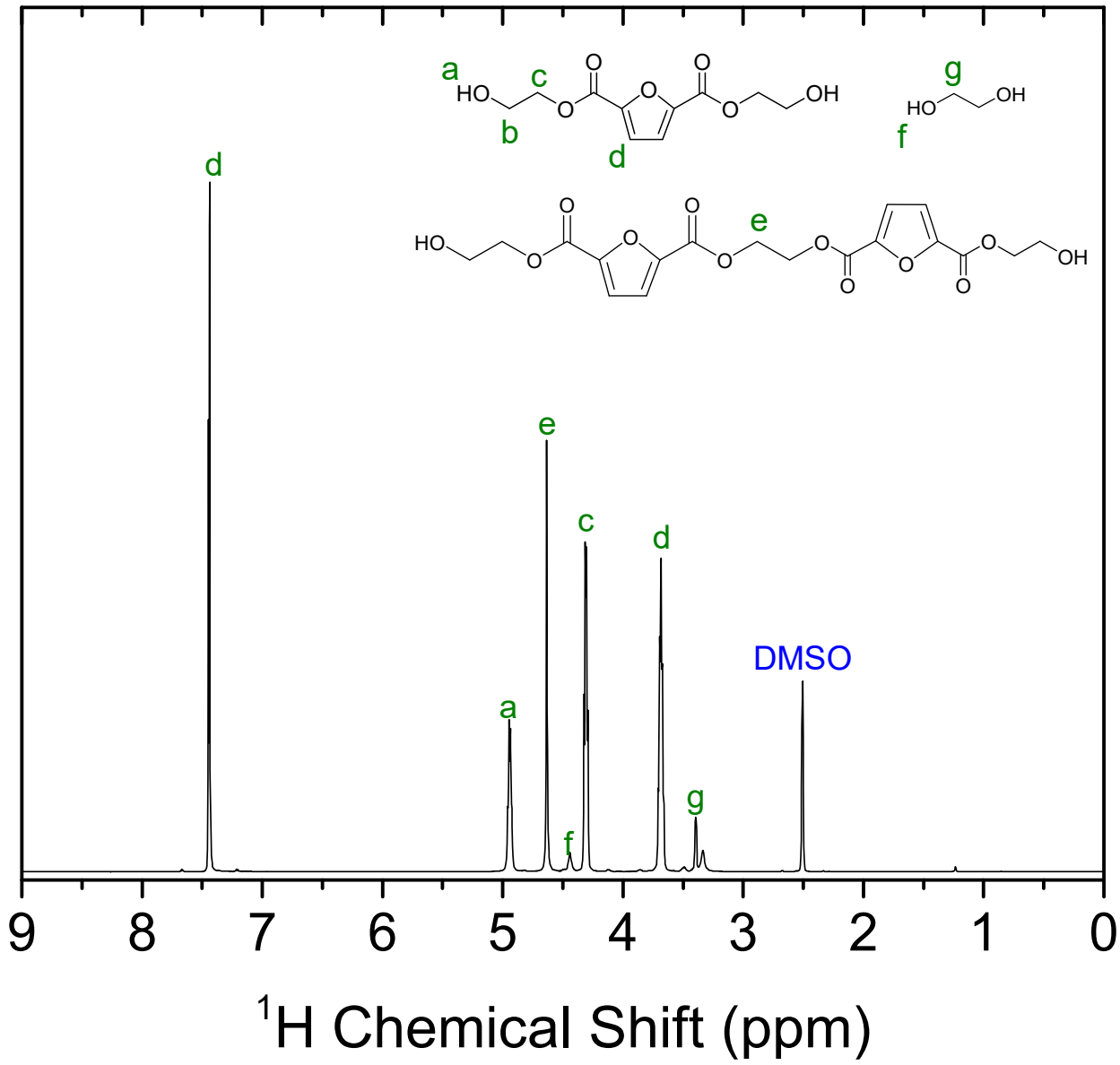

Figure S 4. Proton NMR of recovered BHEF from crystallization. Proton assignments corresponding to BHEF, BHEF dimer, and EG are labeled on the respective chemical structure. The solvent was DMSO (marked).

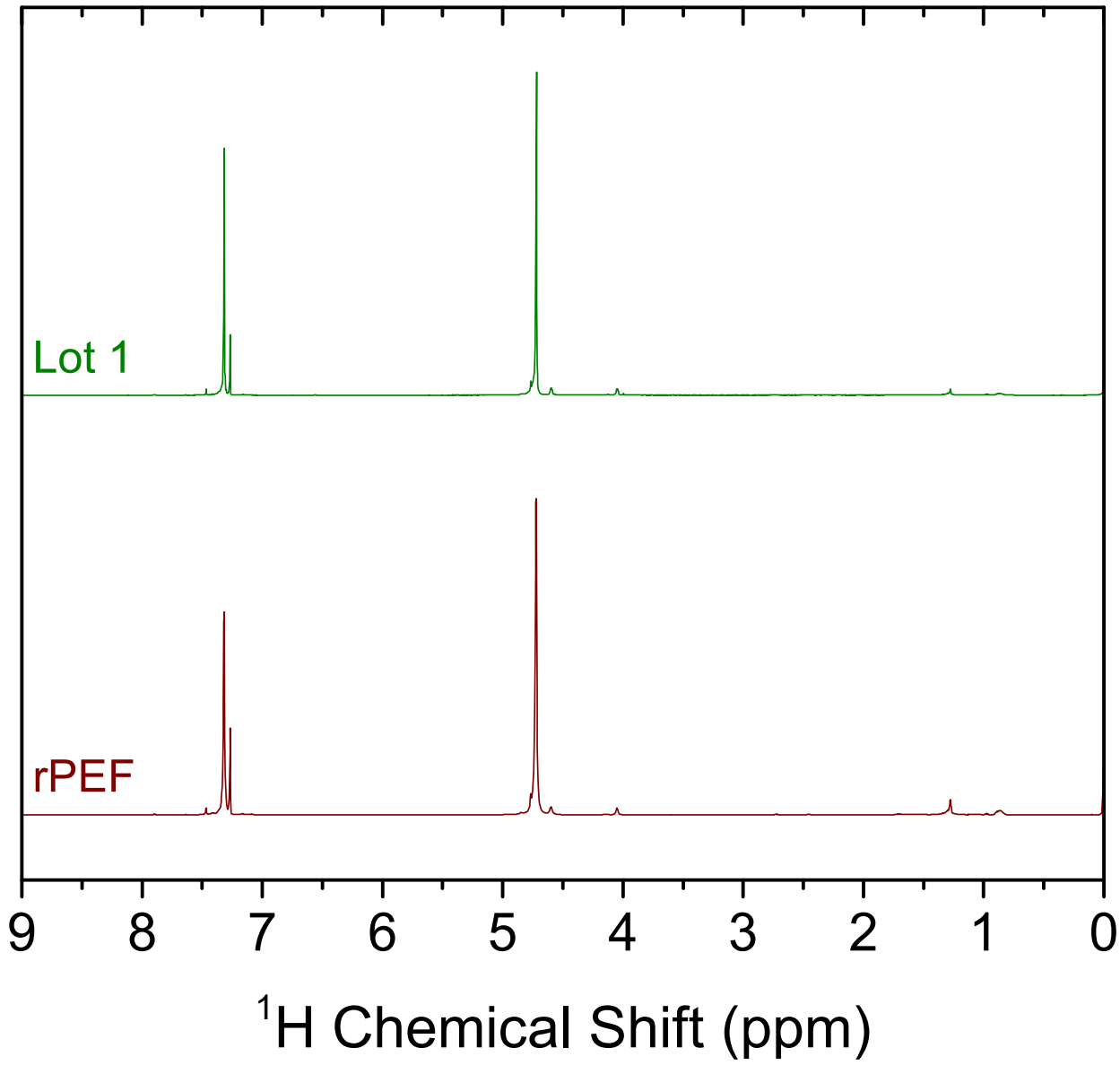

Figure S5. Proton NMR of PEF samples, Lot 1 and rPEF. The solvent was 80:20 solution of CD_3Cl:TFA-d.

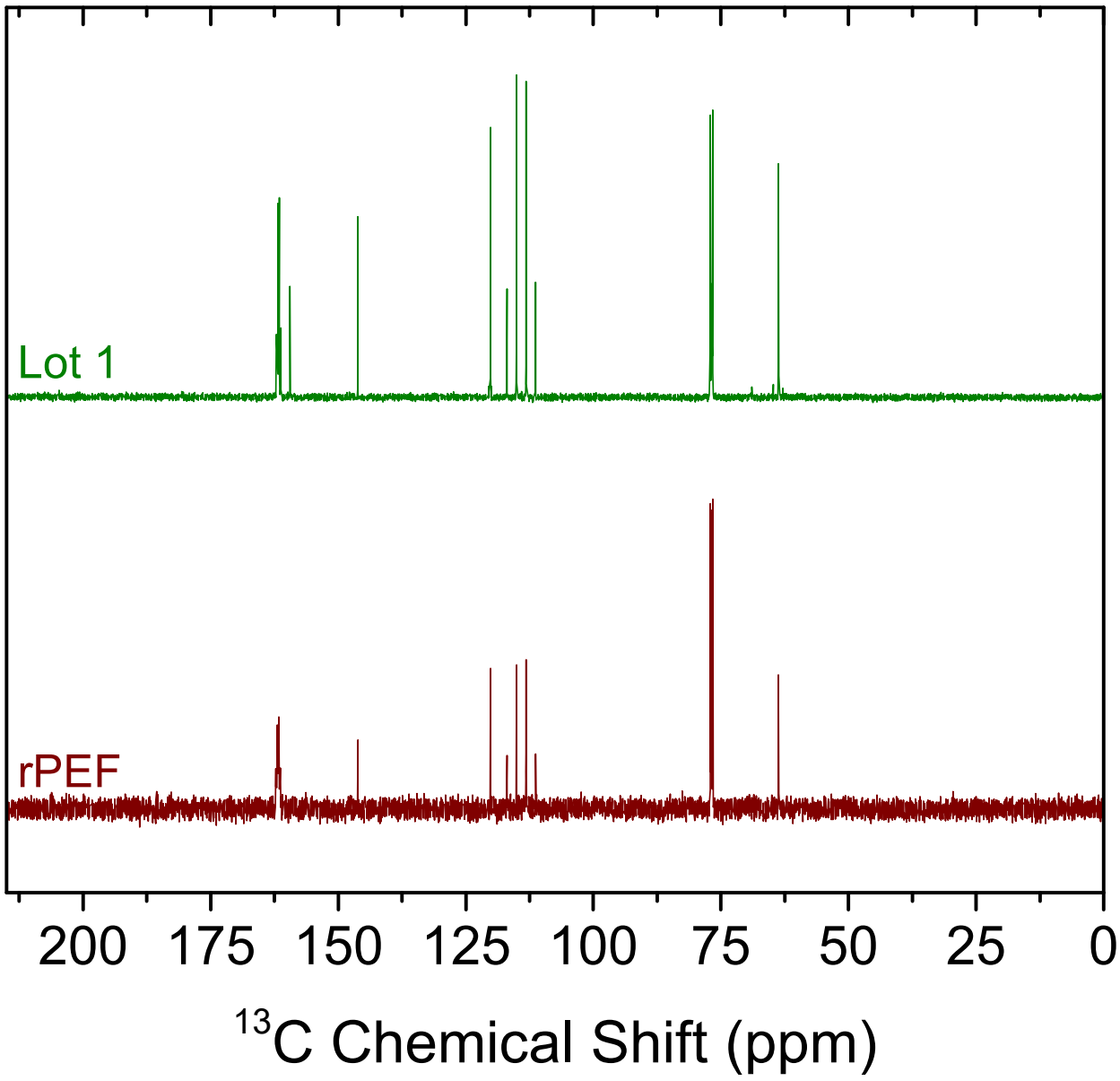

Figure S6. Carbon NMR of PEF samples, Lot 1 and rPEF. The solvent was 80:20 solution of CD_3Cl:TFA-d.