Supporting Information

Degradation of Poly(ethylene terephthalate) Catalyzed by Metal-free Choline-Based Ionic Liquids

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Characterizations of IL

ESI-MS, NMR and FT-IR, as shown in Figure S1, were carried out to identify the structures of the prepared ILs. The results of the chosen catalyst, [Ch][OAc], are mainly displayed here.

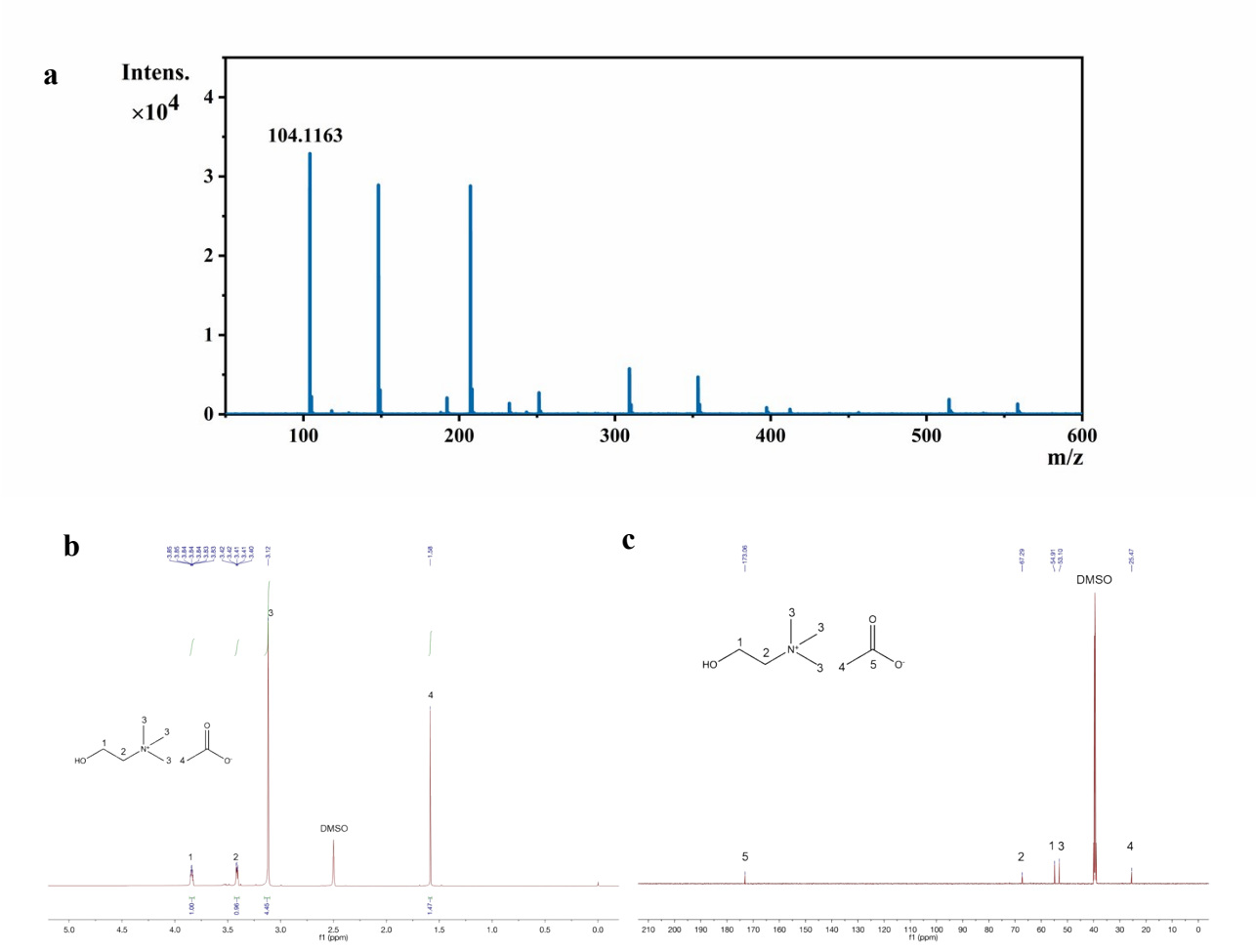


Figure S1. (a) ESI-MS patterns, (b) ^{1}H NMR spectrum and (c) ^{13}C NMR spectrum of [Ch][OAc].

The molecular ion peak at m/z = 104.1163 of ESI-MS patterns in Figure S1. (a) is consistent with the molecular weight of $[Ch]^{+}$, which demonstrates the presence of $[Ch]^{+}$ in the synthesized IL.

The ^{1}H NMR and ^{13}C NMR spectra were reproduced in Figure S1. (b) and (c). The results are as follows:

^{1}H NMR (d_6-DMSO, 600MHz): δ=3.84 (m, 2H, C$\underline{H}_2$OH), 3.41 (m, 2H, C$\underline{H}_2$N$^+$), 3.12 (s, 9H, (C$\underline{H}_3$)3N$^+$), 1.58 (s, 3H, C$\underline{H}_3$CO);

^{13}C NMR (d_6-DMSO, 500MHz): δ=181.20 ($\underline{C}$OO$^-$), 67.40 ($\underline{C}$H$_2$N$^+$), 55.60 ($\underline{C}$H$_2$OH),53.85 (($\underline{C}$H$_3$)$_3$N$^+$), 23.26 ($\underline{C}$H$_3$CO).

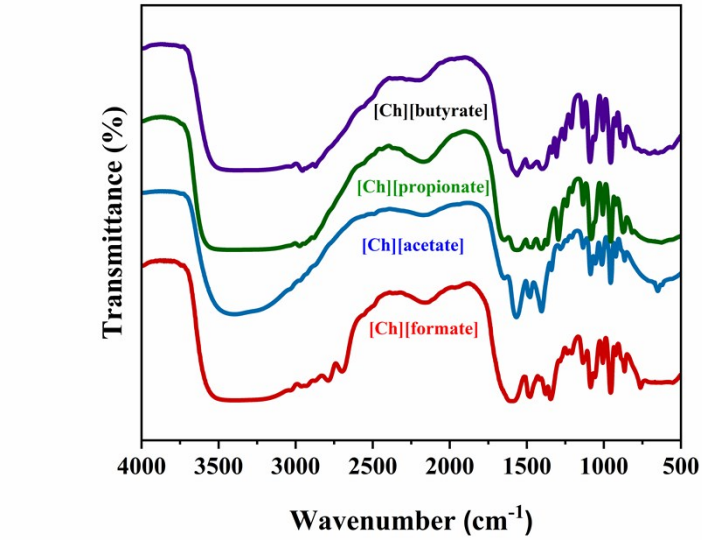


Figure S2. FT-IR spectra of choline-based ILs.

The FT-IR spectra are shown in Figure S2. Various ILs show similar curves in the range of 3500-500 cm^{-1}, which illustrates similarity in their structures. The broad peak between 3500-3000 cm^{-1} are attributed to the stretching vibration of O-H. The asymmetric stretching vibration and symmetric stretching vibration of methyl group are at 2960 cm^{-1} and 2870 cm^{-1}, respectively. Under cover of the O-H broad peak, the intensity of peaks of methyl group is reduced. Absorbance at 1560 cm^{-1} and 1400 cm^{-1} ascribe to the asymmetric stretching vibration and symmetric stretching vibration of C=O bonds in carboxylate anions, respectively.

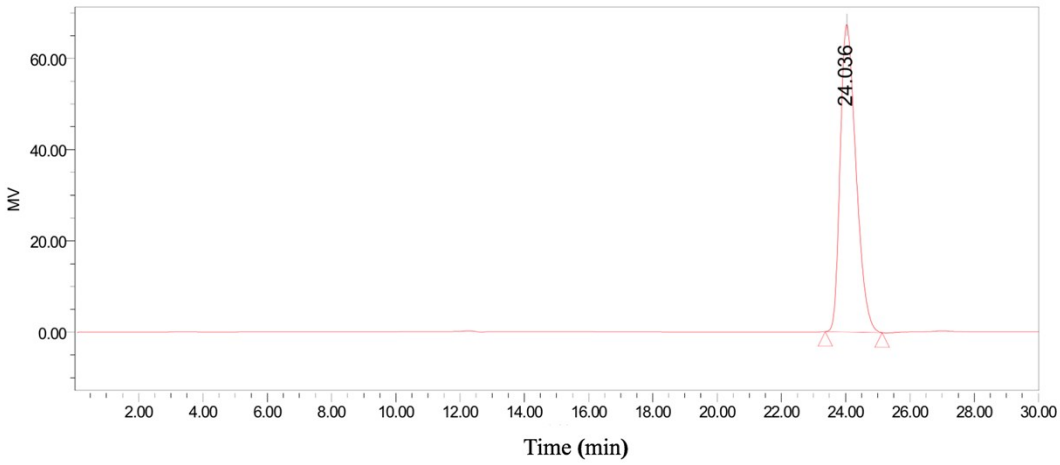
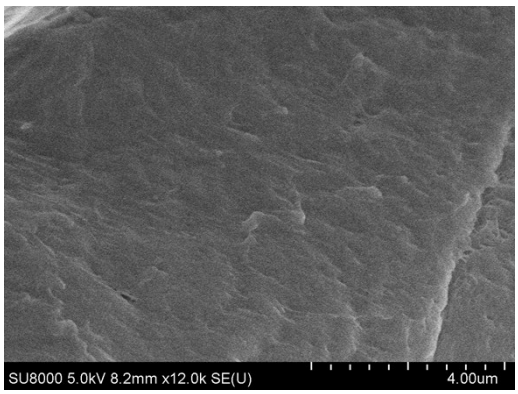


Figure S3. HPLC spectrum of the main product

a



b

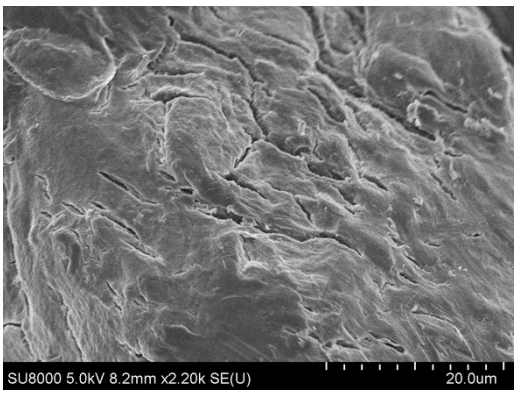


Figure S4. SEM spectra of (a) original PET and (b) residual PET

Table S1. Elemental analysis results of the main product (BHET)

Sample	C (%)	H (%)	O (%)
BHET standard	56.69	5.55	37.76
BHET	56.89	5.63	37.79