ELECTRONIC SUPPLEMENTARY INFORMATION.

SUSTAINABLE CHEMO-ENZYMATIC SYNTHESIS OF GLYCEROL CARBONATE (METH)ACRYLATE FROM GLYCIDOL AND CARBON DIOXIDE ENABLED BY IONIC LIQUID TECHNOLOGIES

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NMR analysis

Samples preparation of reaction media containing SLILs

An aliquot (0.5 mL) of reaction medium, containing the GCA (or GCMA) / $[C_{16}mim][NTf_2]$ mixture, was added to a 1 mL centrifugal vial coupled to a centrifugal nylon filter (0.2 μm pore size, respectively) at 60 °C. The system was cooled to −20 °C for 3 h to obtain full solidification of the mixture, and then centrifuged (15 000 rpm, 5 min) at -5 °C, leading to the filtration of the GCA (or GCMA) product, as liquid phase, to the bottom of the tube, whereas the IL (solid phase) remained in the nylon filter. For the determination of the residual IL content in the product, samples (15 μL) of the product liquid fraction were dissolved in of acetone-δ_6 (0.485 mL) containing of TFA (10 μL, internal standard), then analysed by 400 MHz ^{19}F NMR in a Bruker AC 300E spectrometer.

1. ^{19}F NMR spectrum of the IL [C_{16}mim] [NTf_2]

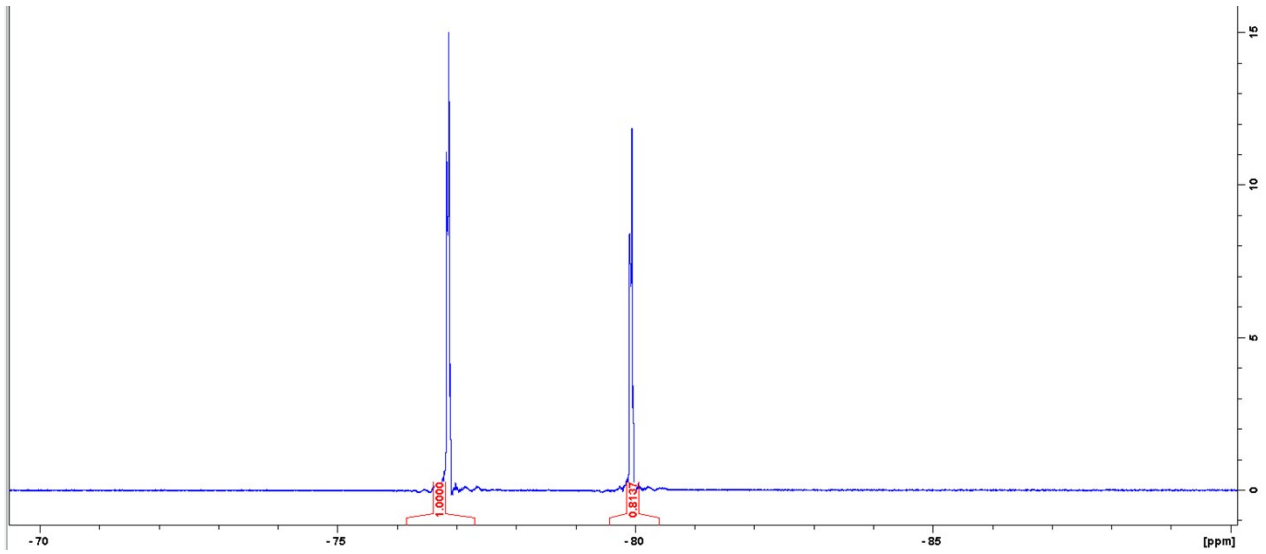

Figure S1. *^{19}F NMR spectrum of the IL [C_{16}mim] [NTf_2] containing 15 mg in 485 µL of* acetone-δ_6.

2. ^{19}F NMR spectrum of the reaction medium (50 % SLIL w/w)

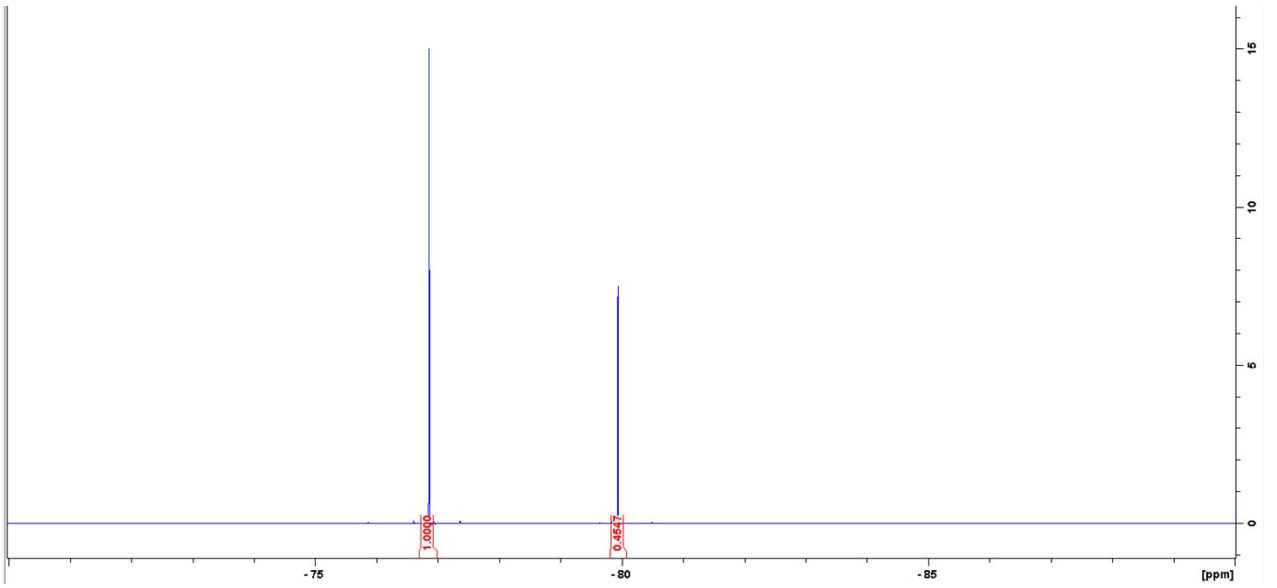

Figure S2. ^{19}F NMR spectrum of the reaction medium containing glycidyl methacrylate in 50% (w/w) of [C_{16}mim][NTf_2].

3. ^{19}F NMR spectrum of the filtrated fraction after one cooling + centrifugation step.

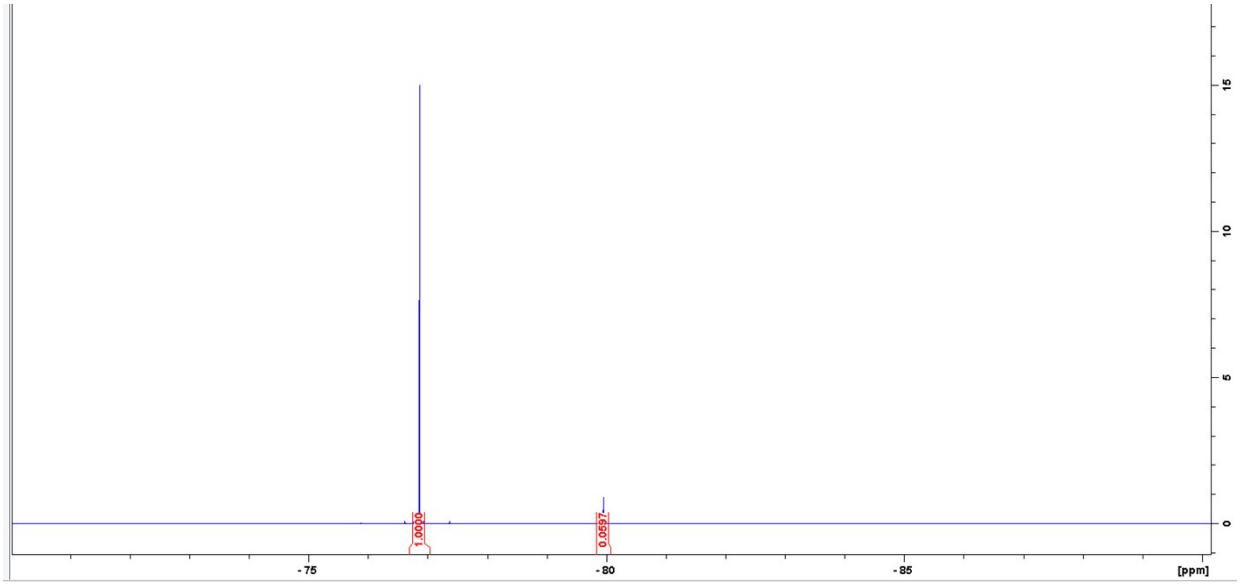

Figure S3. ^{19}F NMR spectrum of the reaction medium containing glycidyl methacrylate in 50% (w/w) of $[C_{16}mim][NTf_2]$ after one cooling/centrifugation step.

4. ^{19}F NMR spectrum of the filtrated fraction after three consecutive cooling + centrifugation steps.

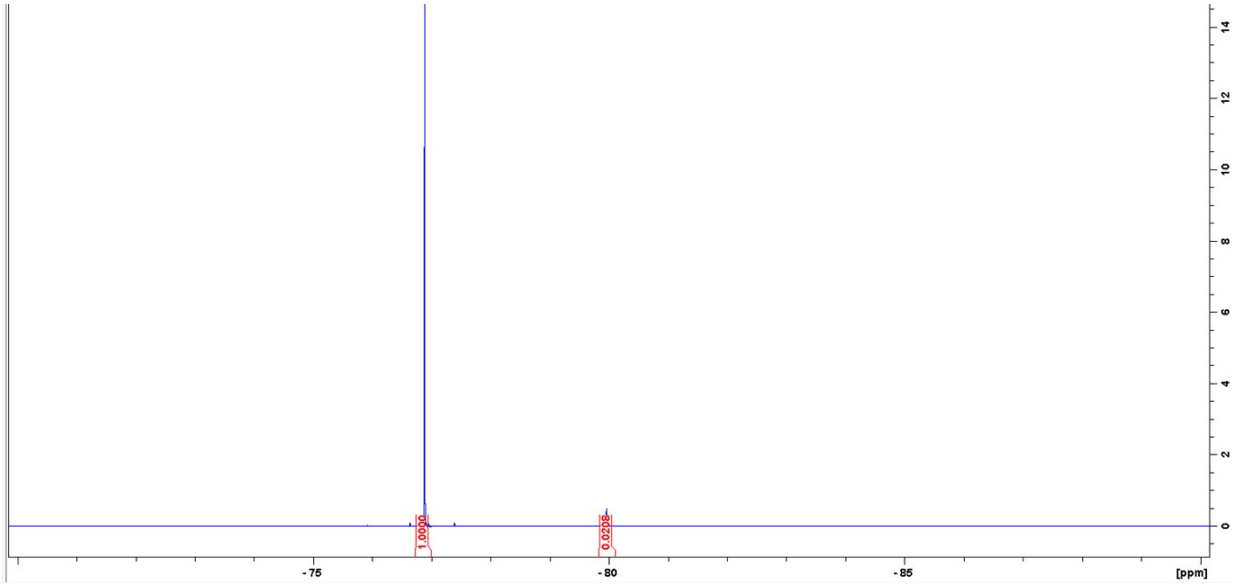

Figure S4. ^{19}F NMR spectrum of the reaction medium containing glycidyl methacrylate in 50% (w/w) of $[C_{16}mim][NTf_2]$ after three consecutive cooling/centrifugation steps.

GC-MS analysis

The glycerol carbonate (meth)acrylate derivatives were identified by GC-MS analyses by using a GC-6890 (Agilent, USA) coupled with a MS-5973 (Agilent, USA) system. The GC was equipped with an HP-5MS column (30 m x 0.25 mm x 0.25 µm, Agilent, USA), used at the following conditions: He flow at 103 mL/min; inlet split ratio, 100:1; temperature program, 40 °C, 8 min; 13 °C/min, 300 °C, 2 min; MS source ionization energy, 70 eV. Retention times (Rt, min) and their m/z ratios: glycerol carbonate acrylate: 10.4 min, positive ion (m/z): 55.1, 100.0, 117.0, 173.0; Glycerol Carbonate Methacrylate: 11.1 min; (m/z): 41.1, 69.1, 86.1, 102.0, 117.0, 186.1.

1.5. Glycerol Carbonate Acrylate MS spectra (Rt: 10.4 min)

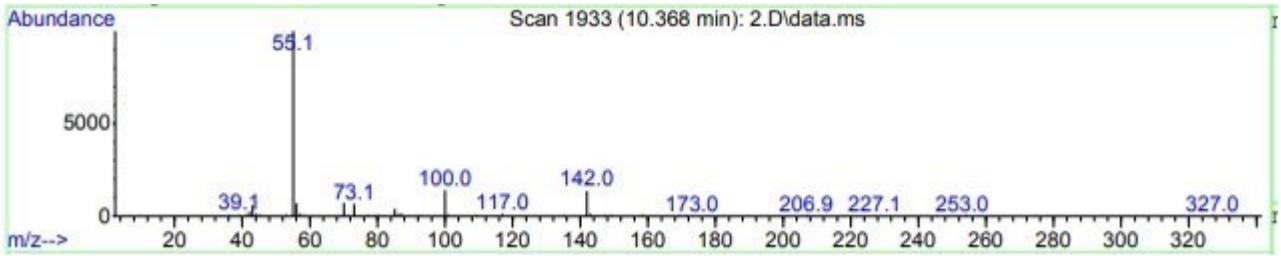

Figure S5. Experimental MS spectra of the Glycerol Carbonate Acrylate.

1.6. Glycerol Carbonate Methacrylate MS spectra (Rt: 10.4 min)

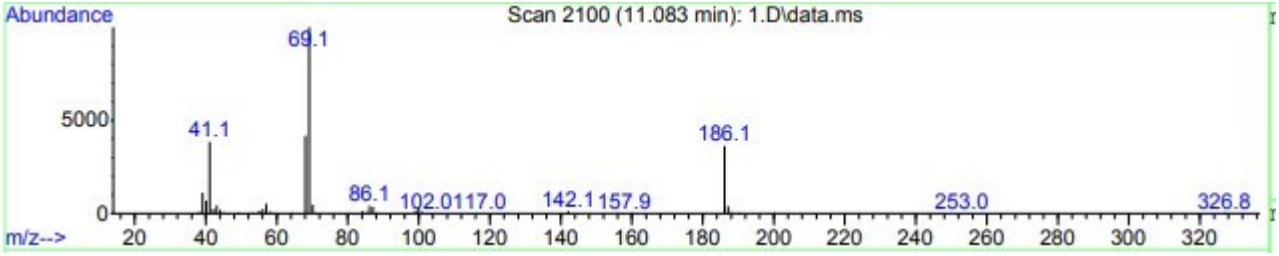

Figure S6. Experimental MS spectra of the Glycerol Carbonate Methacrylate.