

Electronic Supplementary Information

Sterically Controlling 2-Carboxylated Imidazolium Salts for One-Step Efficient Hydration of Epoxides into 1,2-Diols

Qian Su,^{a,c} Xin Tan,^{a,b} Xiaoqian Yao,^a Ting Ying,^a Li Dong,^{a,c} Mengqian Fu,^{a,b} Weiguo Cheng^{*a,c} and Suojiang Zhang^{*a,c}

^a Key Laboratory of Green Process and Engineering, State Key Laboratory of Multiphase Complex Systems, Beijing Key Laboratory of Ionic Liquids Clean Process, Institute of Process Engineering, Chinese Academy of Sciences, Beijing 100190, China. E-mail: wgcheng@ipe.ac.cn, sjzhang@ipe.ac.cn; Fax: +86 10 8262 7080; Tel: +86 10 8262 7080

^b School of Chemistry and Chemical Engineering, University of Chinese Academy of Sciences, Beijing 100049, China

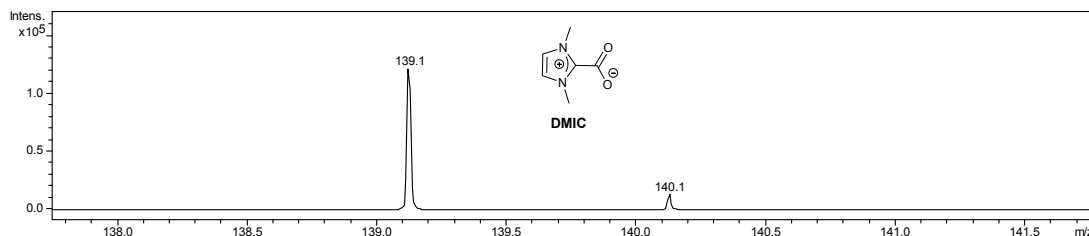
^c Innovation Academy for Green Manufacture, Chinese Academy of Sciences, Beijing 100190, China

Corresponding authors' email address:

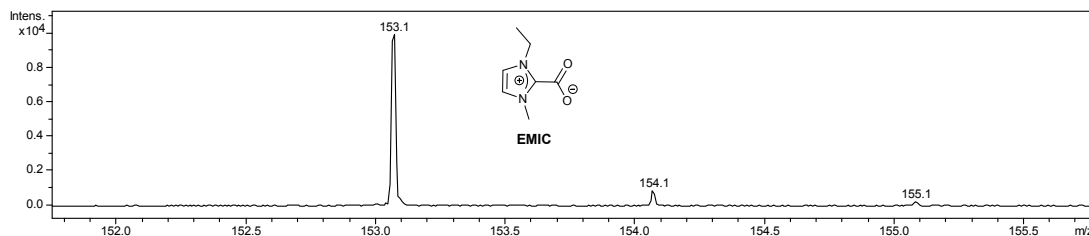
* Weiguo Cheng (wgcheng@ipe.ac.cn)

* Suojiang Zhang (sjzhang@ipe.ac.cn)

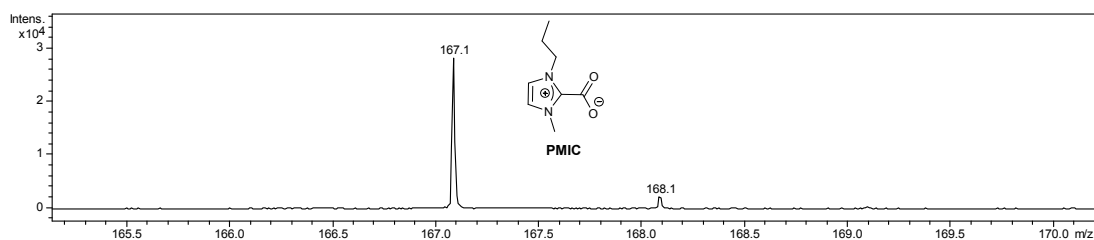
DMIC



EMIC



PMIC



BMIC

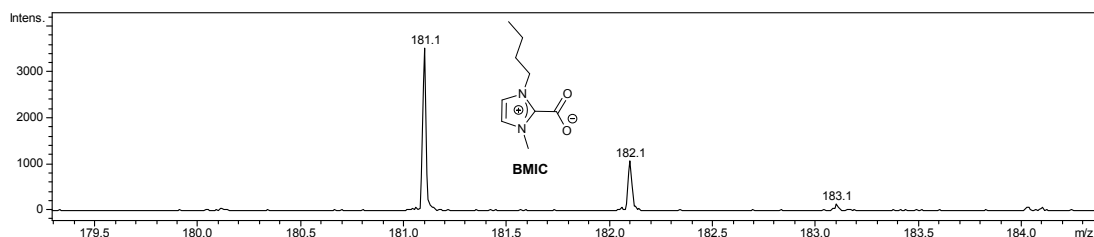


Figure S1. ESI-MS spectra of 2-carboxylated imidazolium salts with different substituent chain lengths from C1 to C4.

Table S1. C/N/H elemental analysis of 2-carboxylated imidazolium salts.

Samples	C [wt.%]	N [wt.%]	C/N molar ratio	C/N theoretical molar ratio
DMIC	19.55	50.47	3.01	3.0
EMIC	16.58	50.22	3.53	3.5
PMIC	13.12	45.08	4.01	4.0
BMIC	12.18	47.57	4.56	4.5

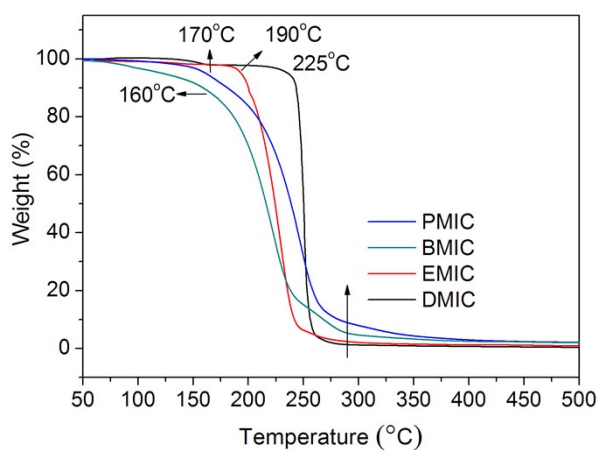
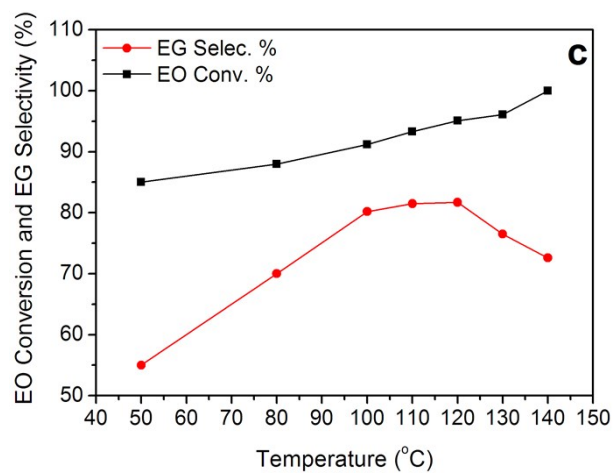
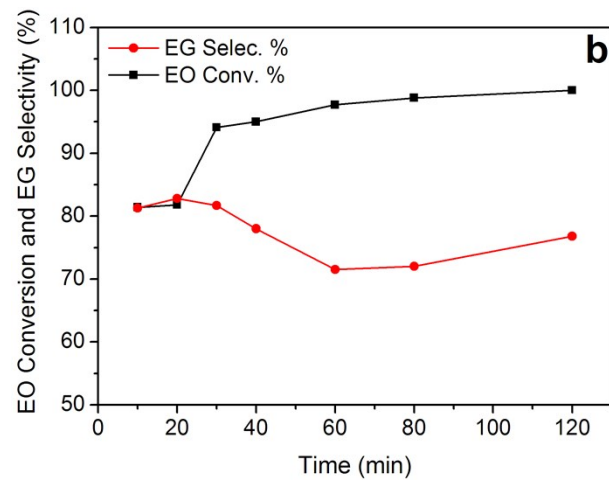
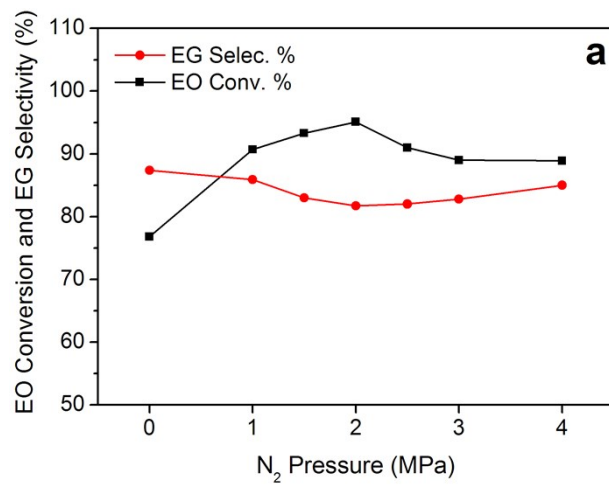


Figure S2. TGA curve of 2-carboxylated imidazolium salts with different chain lengths from C1 to C4.

Table S2. Saturated vapor pressure (PL) of EO under different temperatures calculated from the Aspen Plus TM software

TEMP/°C	50	100	120	130	140
PL/kPa	392.5	1380.1	2073.1	2502.7	2994.2



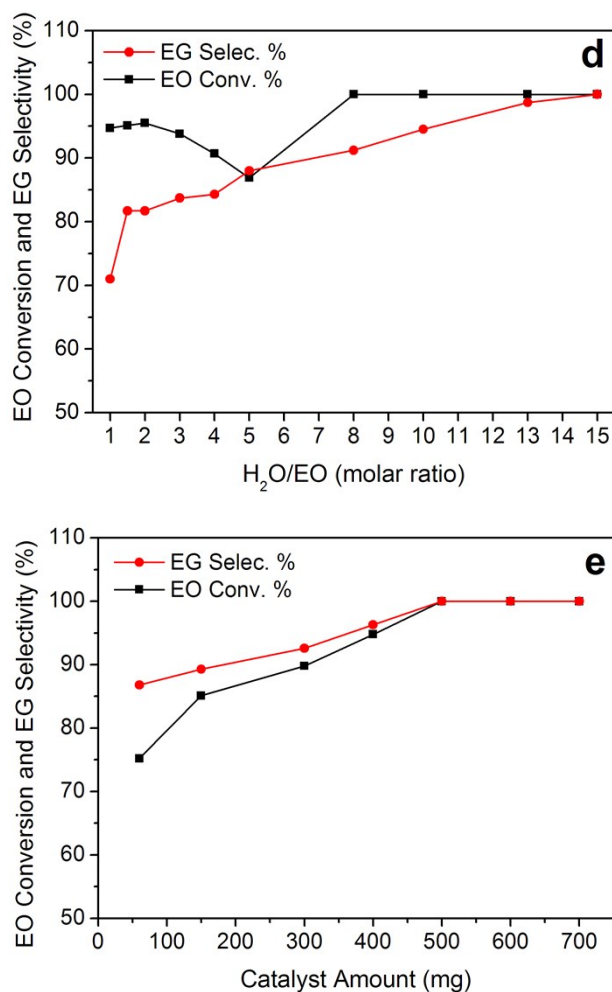


Figure S3. N₂ pressure optimization for EO hydration catalyzed by DMIC (a); Reaction time optimization for EO hydration catalyzed by DMIC (b); Reaction temperature optimization for EO hydration catalyzed by DMIC (c); H₂O/EO molar ratio optimization for EO hydration catalyzed by DMIC (d); Catalyst amount optimization for EO hydration catalyzed by DMIC (e).

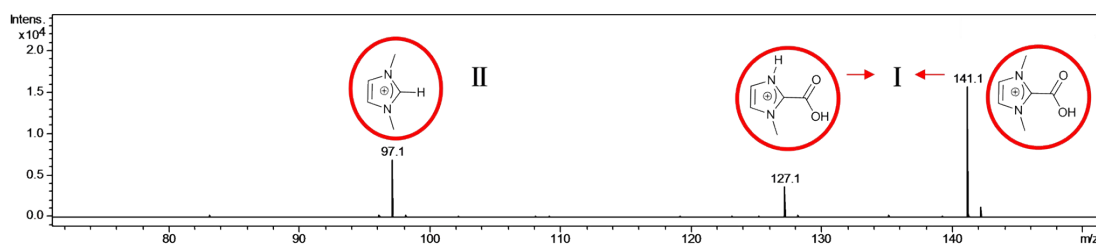


Figure S4. ESI-MS spectra for DMIC in H₂O with positive ion mode