Supporting Information

Aliphatic Carboxylic Acid as Hydrogen-Bond Donor for Converting CO_2 and Epoxide into Cyclic Carbonate under Mild Conditions

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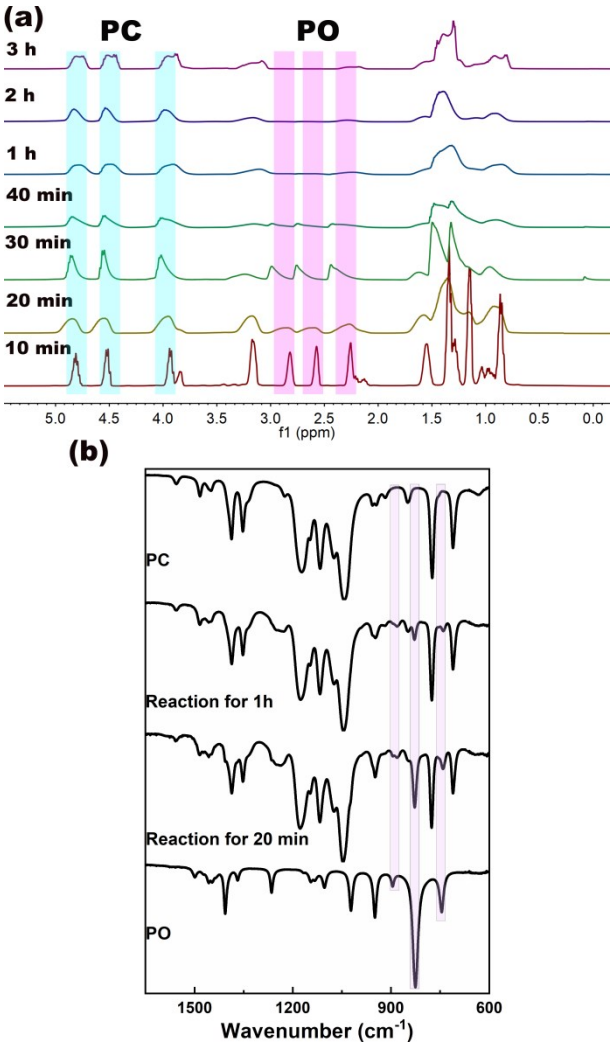

Figure S1. (a) ^{1}H NMR (nuclear magnetic resonance) spectra of the reaction mixture at different processing time (10 min, 20 min, 30 min, 40 min, 1h, 2h and 3h); (b) FT-IR (Fourier transform infrared spectroscopy) spectra of substrate PO, product PC, and the reaction mixture at different processing time (20 min and 1 h). Note that, the catalyst is PA/TBAB, and the reaction conditions are 80 °C and 4 bar injected CO_2. Herein, PO, PC, PA and TBAB are propylene oxide, propylene carbonate and propionic acid and tetrabutylammonium bromide, respectively.

Viewing from the NMR and FT-IR spectra, it is apparent that the amount of substrate PO was decreasing and that of product PC was increasing with the extension of reaction time.

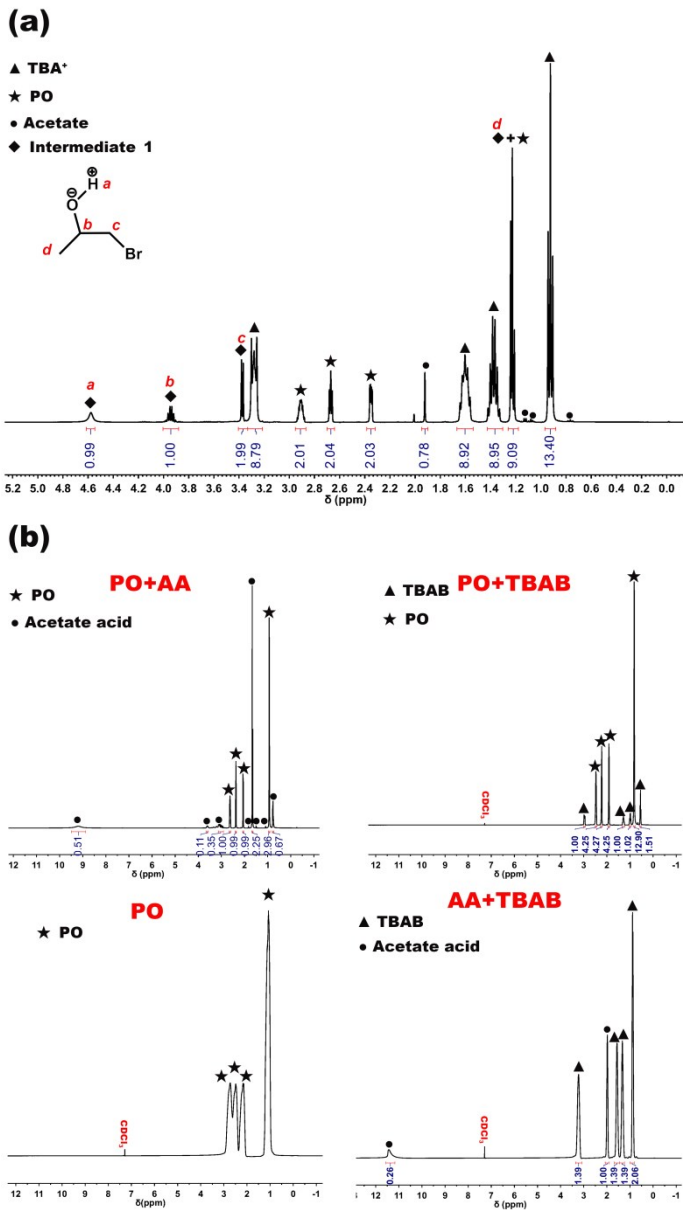

Figure S2. The NMR spectra of (a) the mixture of PO and equivalent (AA = acetic acid), (b) the mixture of PO and AA, PO and TBAB, PO and AA+TBAB. Herein, the catalyst AA/TBAB loading amount was increased to 33 mol% relative to PO for clearly showing the signals.

As shown in Figure S2a&b, a new phase, which can be assigned to the epoxide ring-opening intermediate 1, could only detect in the mixture of PO and AA/TBAB by comparing with other mixture of PO and AA, PO and TBAB, PO and AA and TBAB. Please note that, the NMR signal of AA seems randomly distributed for the mixture of PO and AA, and this probably because of the hydrogen bond formed between AA and (±)-PO molecules.[1] And this phenomenon can be also observed in the NMR of mixture PO and AA/TBAB.

Reference

[1] T. Buruiana, V. Melinte, L. Stroea, E. C. Buruiana, *Polym. J.* **2009**, *41*, 978.