

## Silica grafted ammonium salts based on DABCO as heterogeneous catalysts for cyclic carbonate synthesis from carbon dioxide and epoxides

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### Supporting information

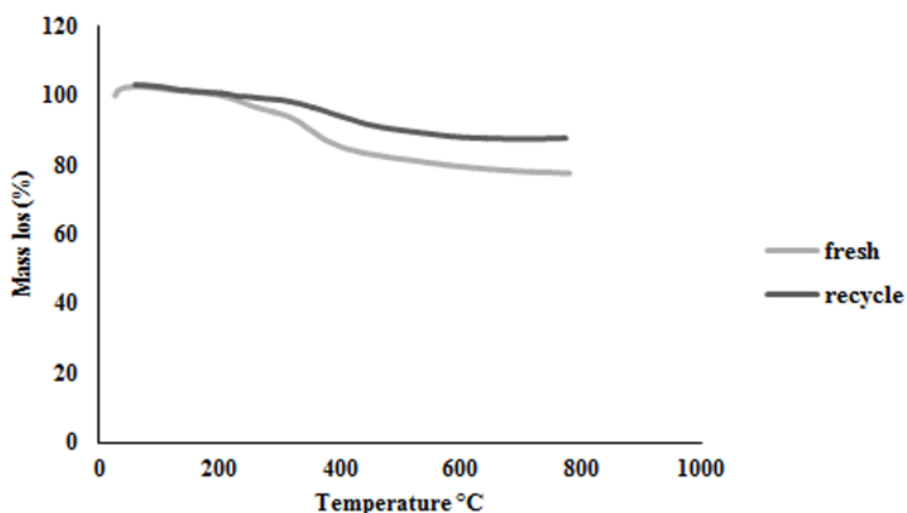


Fig. S1 thermogravimetric curves for fresh SiO<sub>2</sub>-2 (Br) and recycled SiO<sub>2</sub>-2 (Br) (four times)

#### Cycloaddition products:

##### 4-phenyl-1, 3-dioxolan-2-one.

IR (KBr)  $\nu$  1814 (C=O). Mp 52-53.5 °C. <sup>1</sup>H NMR (250 MHz, CDCl<sub>3</sub>)  $\delta$  7.28-7.46 (m, 5H), 5.69 (t, <sup>3</sup>J (H, H) = 8.7 Hz, 1H, OCH), 4.82 (t, <sup>3</sup>J (H, H) = 8.7 Hz, 1H, OCH<sub>2</sub>),  $\delta$  4.36 (t, <sup>3</sup>J (H, H) = 8.7Hz, 1H, OCH<sub>2</sub>). <sup>13</sup>C NMR (CDCl<sub>3</sub>, 62 MHz)  $\delta$  155 (C=O), 135.9, 129.8, 129.3, 126, 78.1, 71.3, MS (EI) m/z 164 (M<sup>+</sup>).

#### **4-Chloromethyl-[1,3]-dioxolan-2-one.**

IR (KBr)  $\nu$  1801 (C=O).  $^1\text{H}$  NMR (250 MHz,  $\text{CDCl}_3$ )  $\delta$  5.01-4.96 (m, 1H, CH); 4.60 (t,  $^3J = 8.7$  Hz, 1H, CH), 4.41 (dd,  $J = 10, 5.0$  Hz, 1H, CH), 3.69-3.79 (m, 2H,  $\text{CH}_2$ ).  $^{13}\text{C}$  NMR ( $\text{CDCl}_3$ , 62 MHz)  $\delta$  154.47 (C=O), 74.55, 67.03, 44.18. MS (EI)  $m/z$  137 ( $\text{M}^+$ ).

#### **4-hexyl-1,3-dioxolan-2-one.**

IR (KBr)  $\nu$  1800 (C=O).  $^1\text{H}$  NMR (250 MHz,  $\text{CDCl}_3$ )  $\delta$  4.65-4.76 (m, 1H), 4.53 (t,  $J = 8.7$  Hz, 1H), 4.07 (t,  $^3J = 8.7$  Hz, 1H), 1.63-1.82 (m, 2H), 1.29-1.50 (m, 8H),  $\delta$  0.86-0.91 (m, 3H).  $^{13}\text{C}$  NMR ( $\text{CDCl}_3$ , 62 MHz)  $\delta$  154.91 (C=O), 77.20, 69.48, 33.78, 31.50, 28.77, 24.30, 22.44, 13.96. MS (EI)  $m/z$  172 ( $\text{M}^+$ ).

#### **Hexahydro-benzo[1,3]dioxol-2-one.**

IR (KBr)  $\nu$  1801 (C=O).  $^1\text{H}$  NMR (250 MHz,  $\text{CDCl}_3$ )  $\delta$  4.66-4.71 (m, 2H), 1.90-1.92 (m, 4H), 1.57-1.65 (m, 2H), 1.42-1.46 (m, 2H),  $^{13}\text{C}$  NMR ( $\text{CDCl}_3$ , 62 MHz)  $\delta$  155.4 (C=O), 75.77, 26.79, 19.17. MS (EI)  $m/z$  142 ( $\text{M}^+$ ).

#### **References**

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