

Supporting Information

Aluminium based binary catalytic system for the solvent free conversion CO₂ to carbonates with high activity and selectivity

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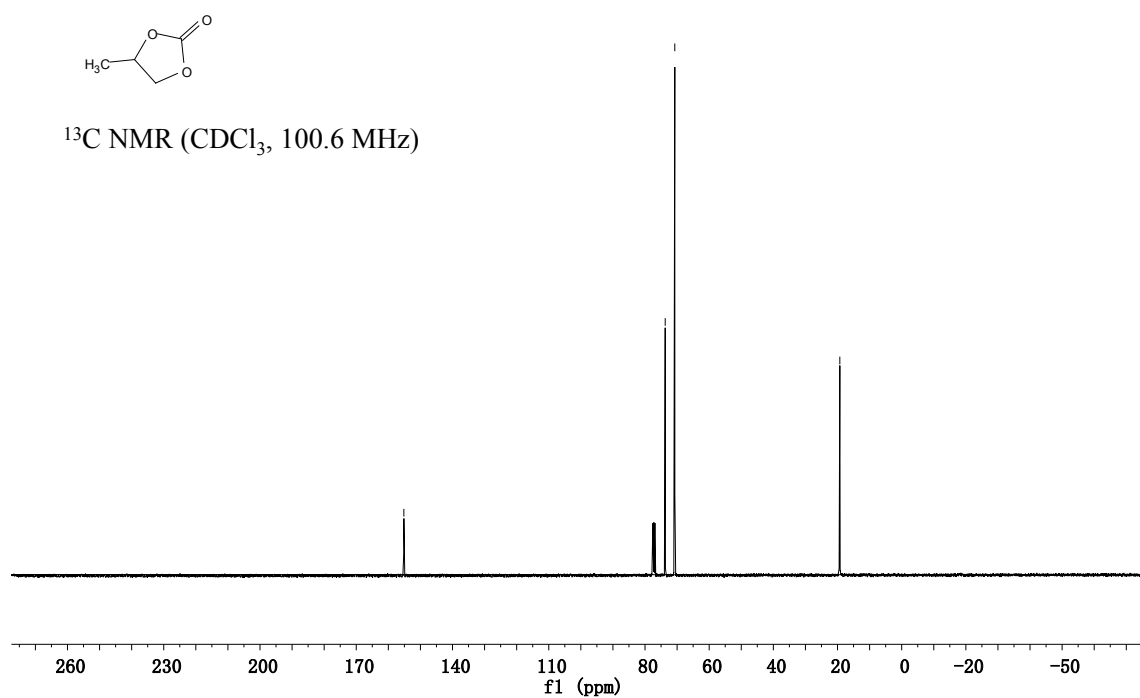
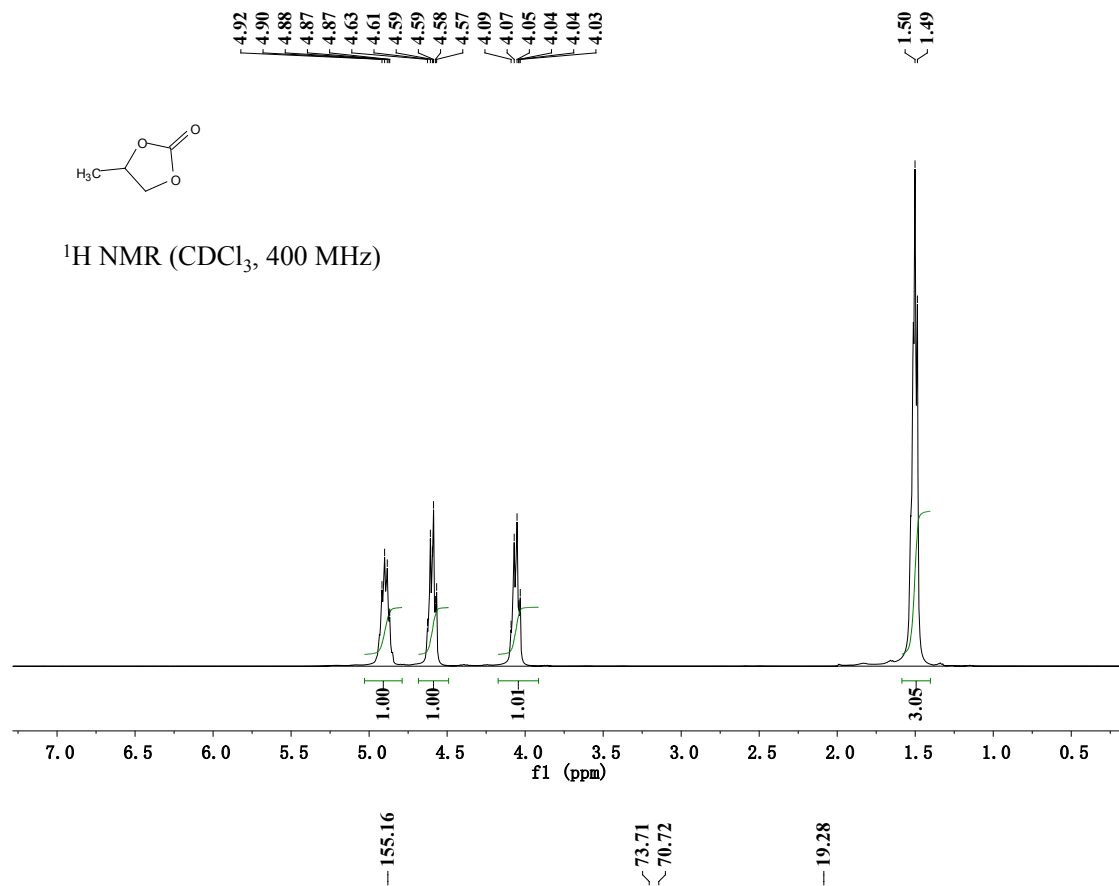
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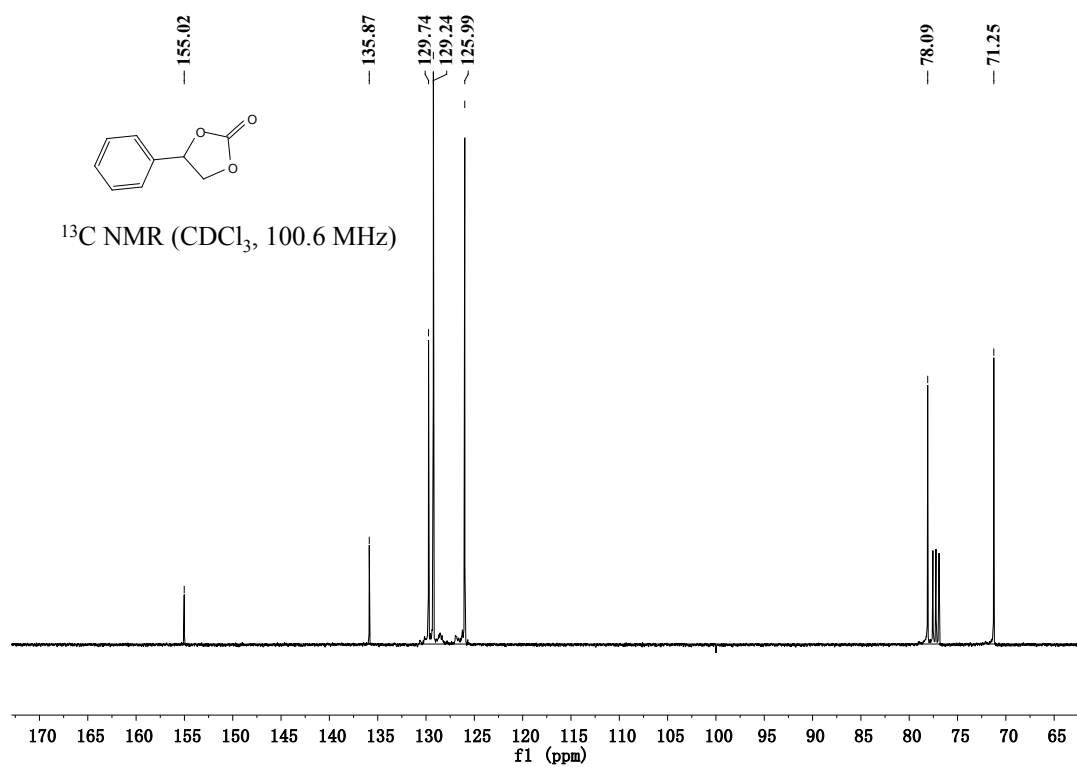
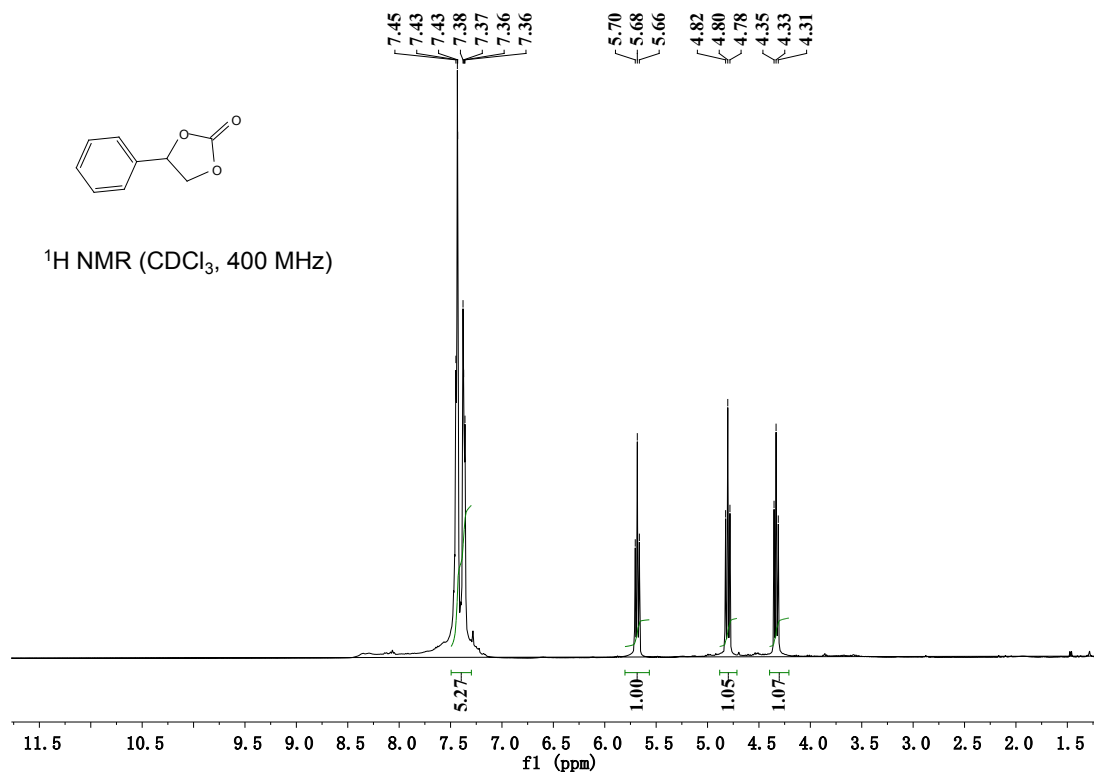
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Characterization data and NMR Spectra Copies

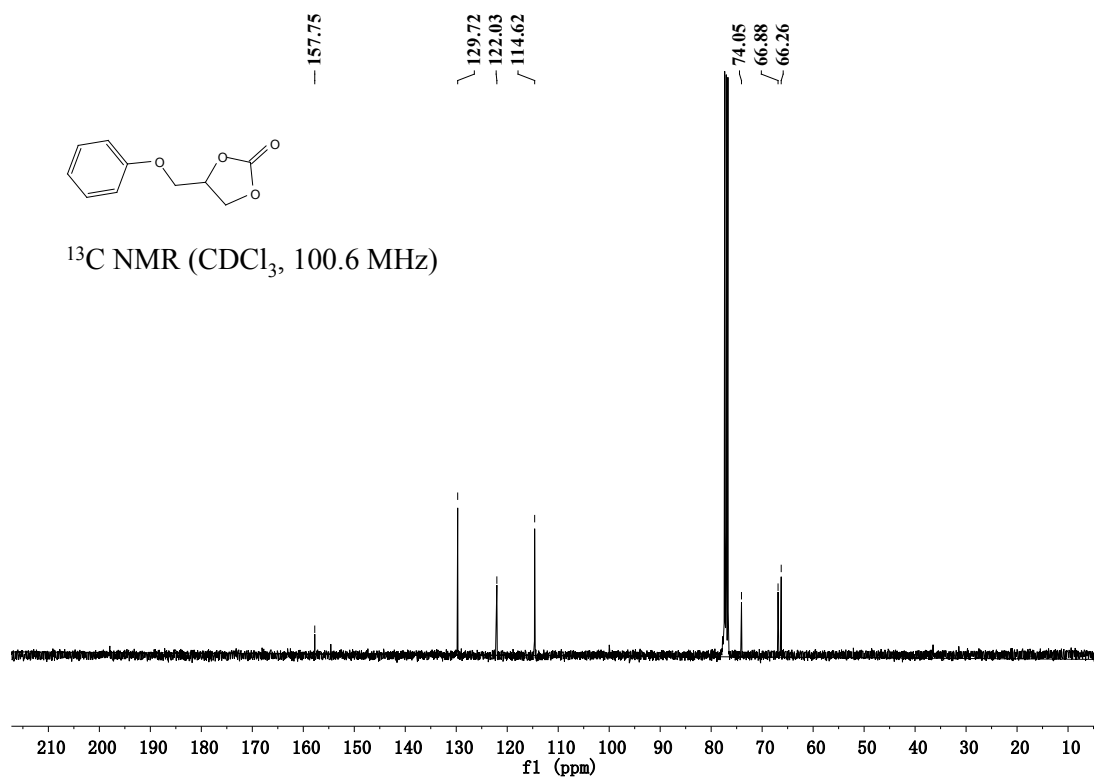
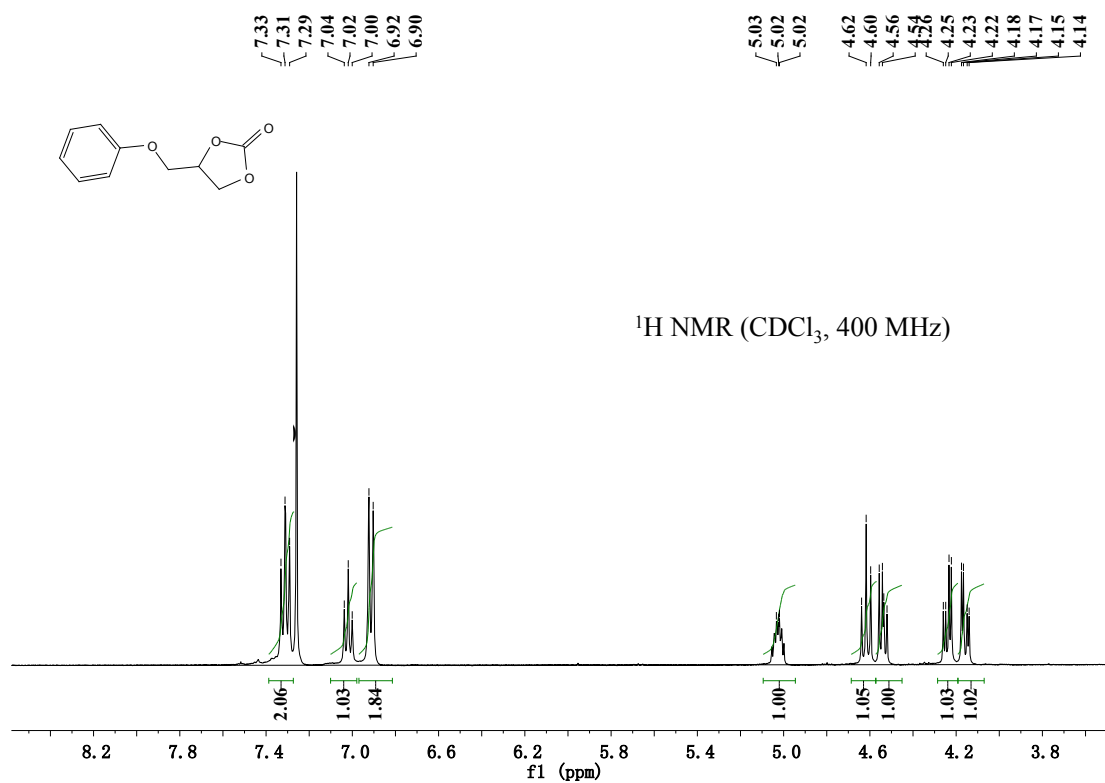
Propylene carbonate: ^1H NMR (400 MHz, CDCl_3) δ 5.03-4.79 (m, 1H), 4.59 (dt, $J = 7.9, 5.3$ Hz, 1H), 4.17-3.91 (m, 1H), 1.49 (d, $J = 6.2$ Hz, 3H); ^{13}C NMR (100.6 MHz, CDCl_3) δ 155.16 (s), 73.71 (s), 70.72 (s), 19.28 (s).



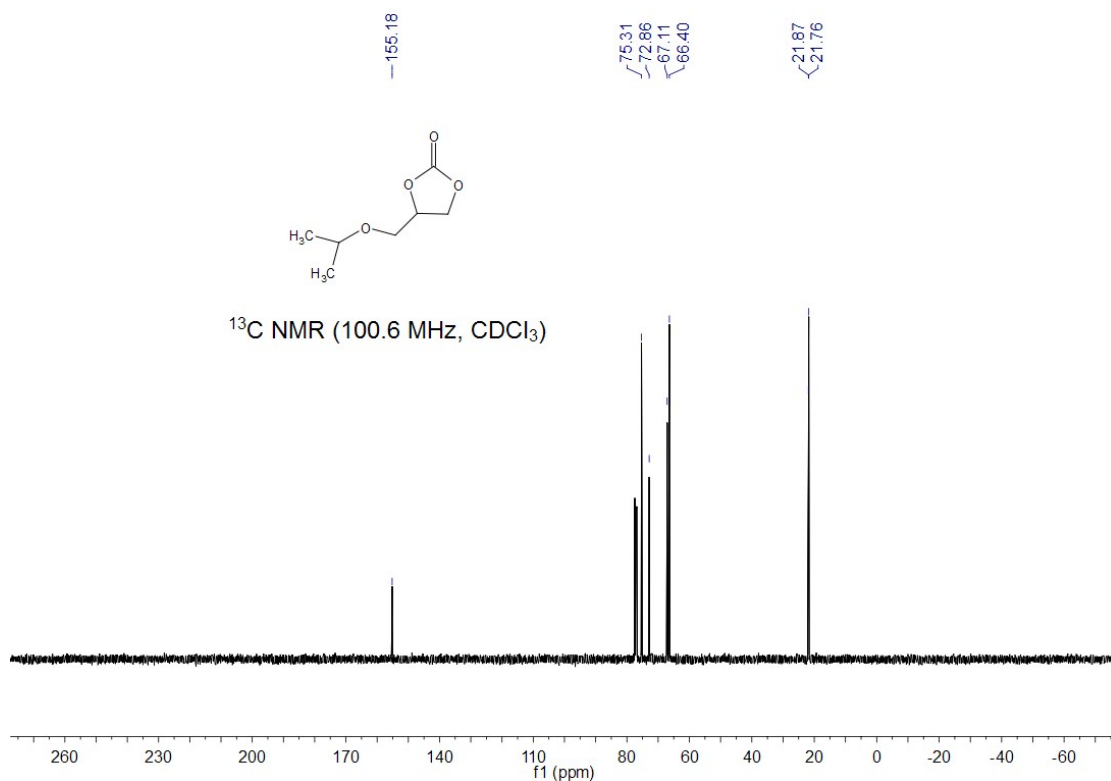
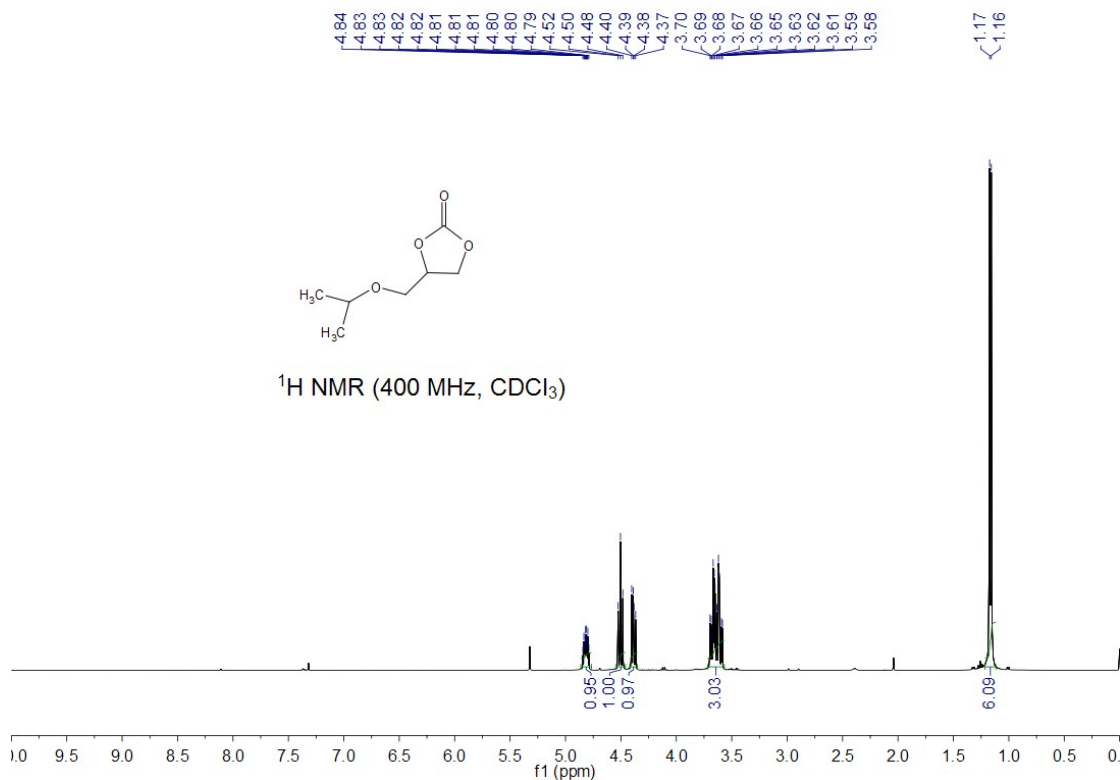
Styrene carbonate: ^1H NMR (400 MHz, CDCl_3) δ 7.49-7.30 (m, 5H), 5.68 (t, $J = 8.0$ Hz, 1H), 4.80 (t, $J = 8.4$ Hz, 1H), 4.33 (t, $J = 8.2$ Hz, 1H); ^{13}C NMR (100.6 MHz, CDCl_3) δ 155.02 (s), 135.87 (s), 129.74 (s), 129.24 (s), 125.99 (s), 78.09 (s), 77.55 (s), 77.23 (s), 76.91 (s), 71.25 (s).



4-Phenoxymethyl-1,3-dioxolan-2-one: ^1H NMR (400 MHz, CDCl_3) δ 7.31 (t, 2H), 7.02 (t, $J = 7.4$ Hz, 1H), 6.91 (d, $J = 7.9$ Hz, 2H), 5.09–4.95 (m, 1H), 4.62 (t, $J = 8.4$ Hz, 1H), 4.54 (dd, $J = 8.5$, 5.9 Hz, 1H), 4.24 (dd, $J = 10.5$, 4.4 Hz, 1H), 4.16 (dd, $J = 10.5$, 3.6 Hz, 1H); ^{13}C NMR (100.6 MHz, CDCl_3) δ 129.72 (s), 122.03 (s), 114.62 (s), 74.05 (s), 66.88 (s), 66.26 (s).

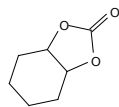


4-*i*-Propoxy-1,3-dioxolan-2-one: ^1H NMR (400 MHz, CDCl_3) δ 4.84 – 4.79 (m, 1H), 4.50 (t, $J = 8.3$ Hz, 1H), 4.33 (dd, $J = 8.3, 6.0$ Hz, 1H), 3.70 – 3.58 (m, 3H), 1.16 (d, $J = 6.1$ Hz, 7H). ^{13}C NMR (101 MHz, CDCl_3) δ 155.18, 75.31, 72.86, 67.10, 66.40, 21.87, 21.75.

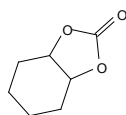
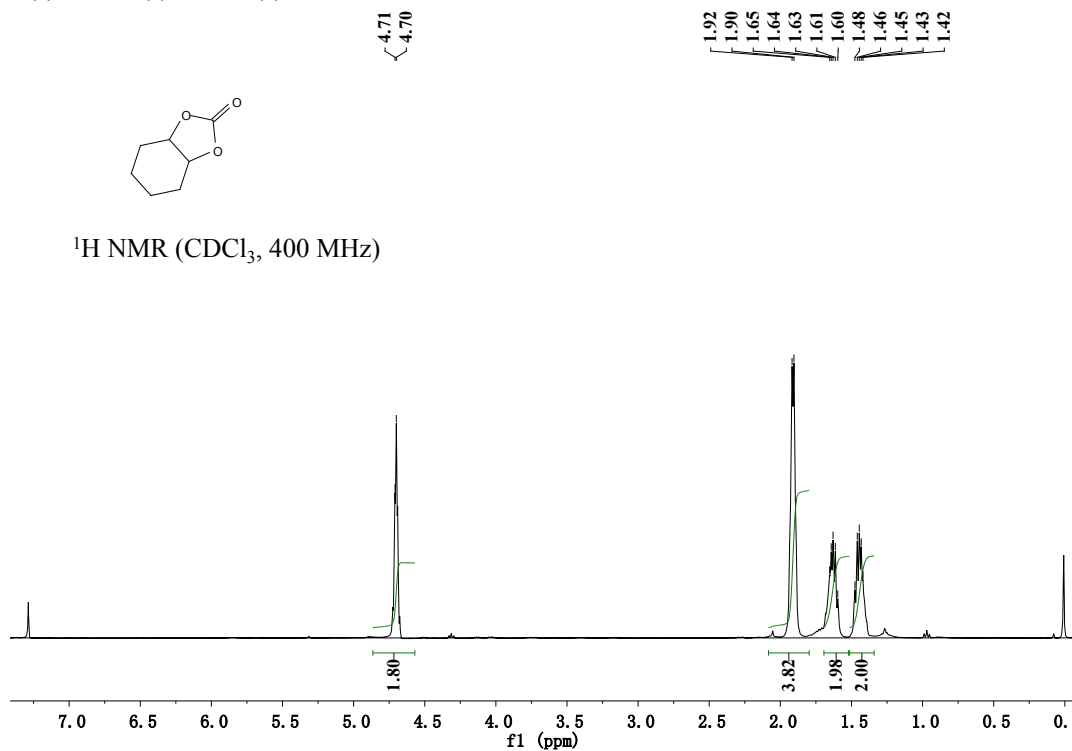


4,4-dimethyl-1,3-dioxolan-2-one: ^1H NMR (400 MHz, CDCl_3) δ 4.17 (s, 2 H), 1.53 (s, 6 H); ^{13}C NMR (100.6 MHz, CDCl_3) δ 154.65, 81.79, 75.39, 25.98.

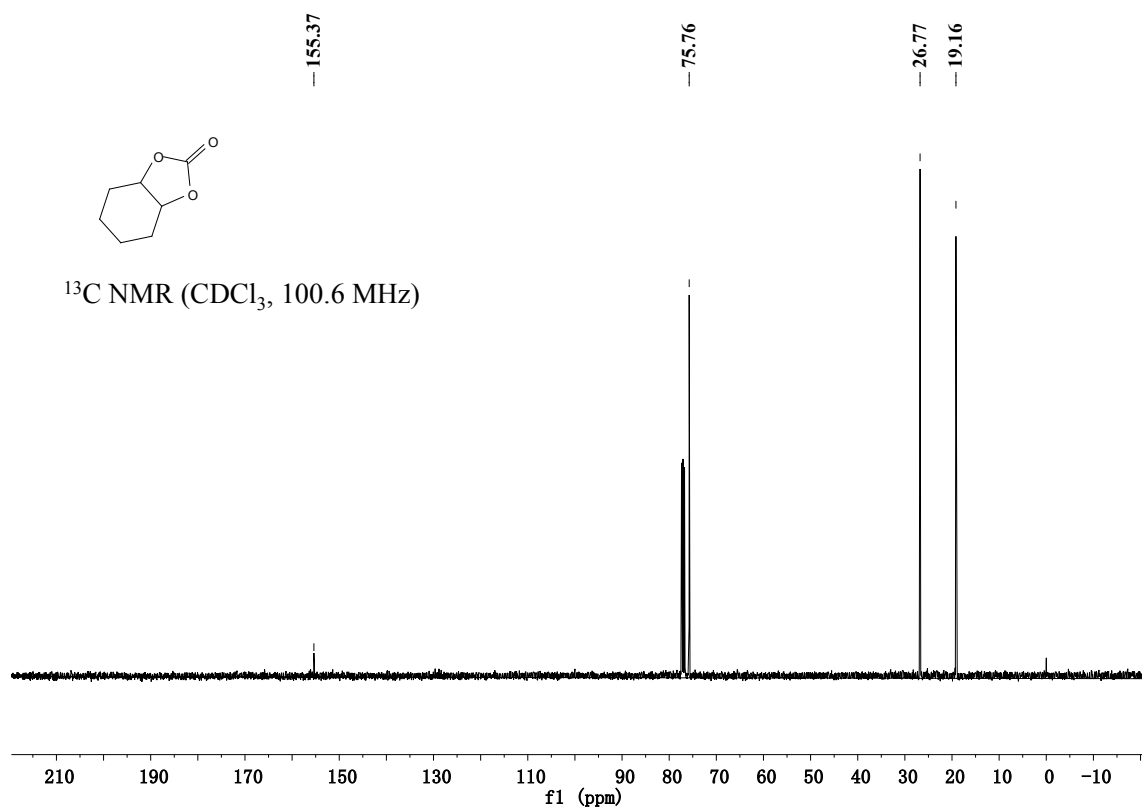
hexahydrobenzo[d][1,3]dioxol-2-one: ^1H NMR (400 MHz, CDCl_3) δ 4.70 (s, 2H), 1.91 (d, $J = 5.4$ Hz, 4H), 1.69-1.52 (m, 2H), 1.51-1.34 (m, 2H); ^{13}C NMR (100.6 MHz, CDCl_3) δ 155.37 (s), 75.76 (s), 26.77 (s), 19.16 (s).



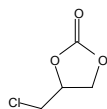
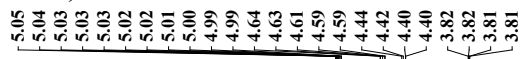
^1H NMR (CDCl_3 , 400 MHz)



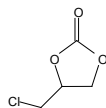
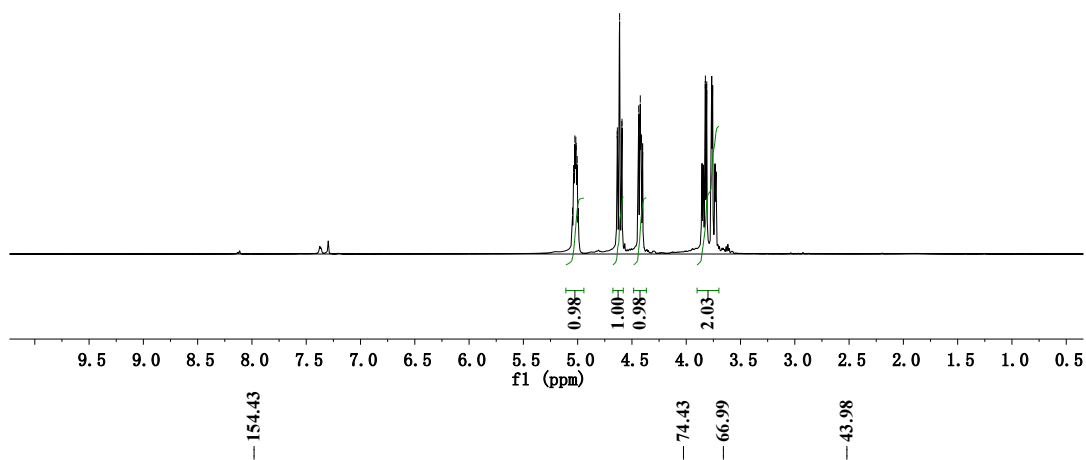
^{13}C NMR (CDCl_3 , 100.6 MHz)



4-(chloromethyl)-1,3-dioxolan-2-one : ^1H NMR (400 MHz, CDCl_3) δ 5.09 – 4.92 (m, 1H), 4.68 – 4.55 (m, 1H), 4.42 (dd, $J = 11.4, 3.2$ Hz, 1H), 3.82 (dd, $J = 5.0, 0.6$ Hz, 2H). ^{13}C NMR (101 MHz, CDCl_3) δ 154.43, 74.43, 66.99, 43.98.



^1H NMR (CDCl_3 , 400 MHz)



^{13}C NMR (CDCl_3 , 100.6 MHz)

