SUPPLEMENTARY MATERIAL

CONVENIENT SYNTHESIS OF ETHYLENE CARBONATES FROM CARBON DIOXIDE AND 1,2-DIOLS AT ATMOSPHERIC PRESSURE OF CARBON DIOXIDE

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1,3-Dioxolan-2-one (2a):¹ The product was isolated as colorless oil, yield 0.2863 g (65%) in the reaction of **1a** (5 mmol). ¹H NMR (400 MHz, CDCl₃) δ 4.52 (s, 4H); ¹³C NMR (100 MHz, CDCl₃) δ 155.4, 64.6; IR (ATR) ν_{max} 1768 cm⁻¹ (C=O).

Dibutyl carbonate (3):² The product was isolated as colorless oil, yield 0.7940 g (91%) in the reaction of **1a** (5 mmol). ¹H NMR (300 MHz, CDCl₃) δ 4.13 (t, *J* = 6.6, 4H), 1.61-1.70 (m, 4H), 1.34-1.47 (m, 4H), 0.94 (t, *J* = 7.4 Hz, 6H); ¹³C NMR (75 MHz, CDCl₃) δ 154.8, 66.8, 30.1, 18.3, 12.9; IR (ATR) ν_{max} 1740 cm⁻¹ (C=O).

4-Ethyl-1,3-dioxolan-2-one (2b):³ The product was isolated as colorless oil, yield 0.4533 g (78%) in the reaction of **1b** (5 mmol). ¹H NMR (400 MHz, CDCl₃) δ 4.54-4.71 (m, 1H), 4.53 (dd, *J* = 7.5, 8.2 Hz, 1H), 4.09 (dd, *J* = 7.5, 8.2 Hz, 1H), 1.78-1.88 (m, 2H), 1.04 (t, *J* = 7.4 Hz, 3H); ¹³C NMR (100 MHz, CDCl₃) δ 155.0, 77.9, 68.9, 26.6, 8.2; IR (ATR) ν_{max} 1780 cm⁻¹ (C=O).

4-Methyl-1,3-dioxolan-2-one (2c):³ The product was isolated as colorless oil, yield 0.2807 g (55%) in the reaction of **1c** (5 mmol). ¹H NMR (400 MHz, CDCl₃) δ 4.81-4.89 (m, 1H), 4.55 (dd, *J* = 7.4, 8.4 Hz, 1H), 4.02 (dd, *J* = 7.4, 8.4 Hz, 1H), 1.50 (d, *J* = 6.4 Hz, 3H); ¹³C NMR (100 MHz, CDCl₃) δ 155.0, 73.5, 70.6, 19.2; IR (ATR) ν_{max} 1780 cm⁻¹ (C=O).

4-Phenyl-1,3-dioxolan-2-one (2d):³ The product was isolated as white solid, yield 0.6045 g (74%) in the reaction of **1d** (5 mmol). ¹H NMR (400 MHz, CDCl₃) δ 7.36-7.47(m, 5H), 5.68 (t, *J* = 8.3 Hz, 1H), 4.80 (t, *J* = 8.3 Hz, 1H), 4.35 (t, *J* = 8.3 Hz, 1H); ¹³C NMR (100 MHz, CDCl₃) δ 154.7, 135.6, 129.3, 128.8, 125.7, 77.7, 70.8; IR (ATR) ν_{max} 1770 cm⁻¹ (C=O).

4-(4-Methylphenyl)-1,3-dioxolan-2-one (2e):⁴ The product was isolated as white solid, yield 0.7128 g (80%) in the reaction of **1e** (5 mmol). ¹H NMR (400 MHz, CDCl₃) δ 7.25 (s, 4H), 5.64 (t, *J* = 8.0 Hz, 1H), 4.77 (t, *J* = 8.0 Hz, 1H), 4.33 (t, *J* = 8.0 Hz, 1H), 2.38 (s, 3H); ¹³C NMR (100 MHz, CDCl₃) δ 154.8, 139.7, 132.6, 129.7, 125.9, 78.0, 71.0, 21.1; IR (ATR) ν_{max} 1787 cm⁻¹ (C=O).

4-(4-Chlorophenyl)-1,3-dioxolan-2-one (2f):⁴ The product was isolated as white solid, yield 0.2806 g (57%) in the reaction of **1f** (2.5 mmol). ¹H NMR (400 MHz, CDCl₃) δ 7.43 (d, *J* = 8.6 Hz, 2H), 7.31 (d, *J* = 8.6 Hz, 2H), 5.67 (t, *J* = 8.0 Hz, 1H), 4.81 (t, *J* = 8.0 Hz, 1H), 4.31 (t, *J* = 8.0 Hz, 1H); ¹³C NMR (100 MHz, CDCl₃) δ 154.4, 135.3, 134.1, 129.1, 127.1, 76.5, 70.7; IR (ATR) ν_{max} 1790 cm⁻¹ (C=O).

4-(2-Naphthalenyl)-1,3-dioxolan-2-one (2g):⁵ The product was isolated as white solid, yield 0.3785 g (71%) in the reaction of **1g** (2.5 mmol). ¹H NMR (400 MHz, CDCl₃) δ 7.85-7.95 (m, 4H), 7.54-7.56 (m, 2H), 7.42-7.44 (m, 1H), 5.85 (t, *J* = 8.0 Hz, 1H), 4.87 (t, *J* = 8.0 Hz, 1H), 4.44 (t, *J* = 8.0 Hz, 1H); ¹³C NMR (100 MHz, CDCl₃) δ 154.8, 133.6, 132.92, 132.90, 129.5, 128.1, 127.8, 127.1, 127.0, 125.8, 122.4, 78.1, 71.0; IR (ATR) ν_{max} 1771 cm⁻¹ (C=O).

4,5-Dimethyl-1,3-dioxolan-2-one (2h):⁶ The product was isolated as colorless oil (a mixture of *cis* and *trans* isomers), yield 0.4207 g (72%) in the reaction of **1h** (5 mmol). ¹H NMR (400 MHz, CDCl₃) δ 4.87-4.80 (m, *cis*), 4.36-4.29 (m, *trans*), 1.47-1.43 (m, *trans*), 1.39-1.36 (m, *cis*); ¹³C NMR (100 MHz, CDCl₃) δ 154.5, 79.8 (*trans*), 75.9 (*cis*), 18.3 (*trans*), 14.3 (*cis*); IR (ATR) ν_{max} 1783 cm⁻¹ (C=O).

***cis*-4,5-Diphenyl-1,3-dioxolan-2-one (2i):**⁶ The product was isolated as white solid, yield 0.6677 g (56%) in the reaction of **1i** (5 mmol). ¹H NMR (400 MHz, CDCl₃) δ 7.13-7.15 (m, 6H), 6.93-6.95 (m, 4H), 5.98 (s, 2H); ¹³C NMR (100 MHz, CDCl₃) δ 154.9, 132.7, 128.7, 128.1, 126.0, 82.0; IR (ATR) ν_{max} 1787 cm⁻¹ (C=O).

***trans*-4,5-Diphenyl-1,3-dioxolan-2-one (2j):**⁶ The product was isolated as white solid, yield 0.9580 g (80%) in the reaction of **1j** (5 mmol). ¹H NMR (400 MHz, CDCl₃) δ 7.42-7.45 (m, 6H), 7.31-7.33 (m, 4H), 5.44 (s, 2H); ¹³C NMR (100 MHz, CDCl₃) δ 154.0, 134.7, 129.7, 129.2, 126.0, 85.3; IR (ATR) ν_{max} 1809 cm⁻¹ (C=O).

***cis*-Hexahydro-1,3-benzodioxol-2-one (2k):**⁷ The product was isolated as colorless gel, yield 0.3848 g (54%) in the reaction of **1k** (2.5 mmol).. ¹H NMR (400 MHz, CDCl₃) δ 4.68-4.72 (m, 2H), 1.82-1.95 (m, 4H), 1.57-1.67 (m, 2H), 1.39-1.48 (m, 2H); ¹³C NMR (100 MHz, CDCl₃) δ 155.3, 75.6, 26.6, 18.9; IR (ATR) ν_{max} 1781 cm⁻¹ (C=O).

***trans*-1,2-Cyclohexanediylcarbonic acid dibutyl ester (4):** The product was isolated as colorless oil, yield 0.8384 g (53%) in the reaction of **11** (5 mmol). Colorless oil. ^1H NMR (400 MHz, CDCl_3) δ 4.65-4.67 (m, 2H), 4.13 (t, $J = 7.4$ Hz, 4H), 2.13-2.16 (m, 2H), 1.68-1.75 (m, 2H), 1.61-1.66 (m, 4H), 1.32-1.47 (m, 8H), 0.93 (t, $J = 7.4$ Hz, 6H); ^{13}C NMR (100 MHz, CDCl_3) δ 154.4, 76.9, 67.7, 30.5, 29.7, 23.0, 18.7, 13.5; IR (ATR) ν_{max} 1739 cm^{-1} (C=O). HRMS (FAB) calcd for $\text{C}_{16}\text{H}_{29}\text{O}_6$ (MH^+): 317.1964; found: 317.1963.

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