Electronic supplementary materials *Mendeleev Commun.*, 2025, **35**, 558–559

Cadmium catalyst with industrial polymeric nitrogen-containing ligand for the addition of carbon dioxide to oxiranes

Sergey E. Lyubimov and Polina V. Cherkasova

^{1}H NMR spectra were recorded on a Bruker Avance 400 and Avance 300 instruments (400 and 300 MHz). The chemical shifts were referred to the signals of residual protons of the solvent ($CDCl_3$).

4-Methyl-1,3-dioxolan-2-one **2a**: colorless oil, ^{1}H NMR (300 MHz, $CDCl_3$) δ: 1.3 (d, J = 6 Hz, 3H, CH_3), 3.9 (t, J = 8 Hz, 1H, ½CH_2), 4.4 (t, J = 8 Hz, 1H, ½CH_2), 4.6-4.8 (m, 1H, CH). The spectral characteristics of carbonate **2a** correspond to the literature data.[S1]

4-Ethyl-1,3-dioxolan-2-one **2b**: colorless oil, ^{1}H NMR (400 MHz, $CDCl_3$) δ: 0.9 (t, J = 8 Hz, 3H, CH_3), 1.7 (m, 2H, CH_2), 4.0 (*t*, J = 8 Hz, 1H, ½CH_2), 4.4 (t, J = 8 Hz, 1H, ½CH_2), 4.5-4.6 (m, 1H, CH). The spectral characteristics of carbonate **2b** correspond to the literature data.[S1]

4-Chloromethyl-1,3-dioxolan-2-one **2c**: colorless oil, ^{1}H NMR (400 MHz, $CDCl_3$) δ: 3.7-3.8 (m, 2H, CH_2Cl), 4.4 (dd, J = 8, 6 Hz, 1H, ½CH_2), 4.6 (t, J = 8 Hz, 1H, ½CH_2), 5.0 (m, 1H, CH). The spectral characteristics of carbonate **2c** correspond to the literature data.[S1]

4-Phenyl-1,3-dioxolan-2-one **2d**: white solid, *m.p.* = 60 °C, ^{1}H NMR (400 MHz, $CDCl_3$) δ: 4.3 (dd, J = 8, 7 Hz, 1H, ½CH_2), 4.8 (t, J = 8 Hz, 1H, ½CH_2), 5.7 (t, J = 8 Hz, 1H, CH), 7.3-7.5 (m, 5H, Ar). The spectral characteristics of carbonate **2d** correspond to the literature data.[S1]

4-Phenoxymethyl-1,3-dioxolan-2-one **2e**: white solid, *m.p.* = 82 °C, ^{1}H NMR (400 MHz, $CDCl_3$) δ: 4.1 (dd, J = 10, 3 Hz, 1H, ½CH_2), 4.2 (dd, J = 10, 3 Hz, 1H, ½CH_2), 4.5 (dd, J = 8, 5 Hz, 1H, ½CH_2), 4.6 (t, J = 8 Hz, 1H, ½CH_2), 5.0-5.1 (m, 1H, CH), 6.9 (d, J = 8 Hz, 2H, Ar), 7.0 (t, J = 7 Hz, 1H, Ar), 7.30 (t, J = 7.7 Hz, 2H, Ar). The spectral characteristics of carbonate **2e** correspond to the literature data.[S1]

4-Allyloxymethyl-1,3-dioxolan-2-one **2f**: colorless oil, ^{1}H NMR (300 MHz, $CDCl_3$) δ: 3.4 (dd, J = 9, 3 Hz, 1H, ½CH_2, CH_2O), 3.6 (dd, J = 9, 3 Hz, 1H, ½CH_2, CH_2O), 3.9 (d, J = 3 Hz, 2H, CH_2O), 4.2 (dd, J = 6, 3 Hz, 1H, ½CH_2), 4.4 (t, J = 6 Hz, 1H, ½CH_2), 4.7-4.8 (m, 1 H, CH), 5.0-5.2 (m, 2H, CH_2 *allyl*), 5.6-5.8 (m, 1H, CH *allyl*). The spectral characteristics of carbonate **2f** correspond to the literature data.[S1]

4-Diethylaminomethyl-1,3-dioxolan-2-one **2g**, yellow oil, ^{1}H NMR (300 MHz, $CDCl_3$) δ: 0.97 (t, J = 9 Hz, 6 H, $2CH_3$), 2.3-2.4 (m, 4 H, $2CH_2$), 2.5-2.6 (m, 4H, CH_2N), 2.6-2.8 (m, 2H, CH_2N), 4.2 (t, J = 6 Hz, 1H, ½CH_2), 4.4 (t, J = 9 Hz, 1H, ½CH_2), 4.6-4.8 (m, 1H, CH). The spectral characteristics of carbonate **2g** correspond to the literature data.[S2]

4,4'-(((Propane-2,2-diylbis(4,1-phenylene))bis(oxy))bis(methylene))bis(1,3-dioxolan-2-one) **4**: white solid, *m.p.* = 162 °C, ^{1}H NMR (400 MHz, $CDCl_3$) δ: 1.65 (s, 6H, $2CH_3$), 4.1 (dd, J = 8, 4 Hz, 2H, CH_2), 4.2 (dd, J = 8, 4 Hz, 2H, CH_2), 4.5-4.6 (m, 4H, $2CH_2$), 4.9-5.1 (m, 2H, CH), 6.8 (d, J = 9 Hz, 4H *Ar*), 7.1 (d, J = 9 Hz, 4H, *Ar*). The spectral characteristics of carbonate **4** correspond to the literature data.[S3]

References

[S1] H. Zhou, G.-X. Wang, W.-Z. Zhang and X.-B. Lu, *ACS Catal.*, 2015, **5**, 6773; https://doi.org/10.1021/acscatal.5b01409.

[S2] V. Legros, G. Taing, P. Buisson, M. Schuler, S. Bostyn, J. Rousseau, C. Sinturel and A. Tatibouet, *Eur. J. Org. Chem.*, 2017, **34**, 5032; https://doi.org/10.1002/ejoc.201700646.

[S3] J.-Z. Hwang, S.-C. Wang, P.-C. Chen, C.-Y. Huang, J.-T. Yeh and K.-N. Chen, *J. Polym.* Res., 2012, **19**, 9900; https://doi.org/10.1007/s10965-012-9900-y.

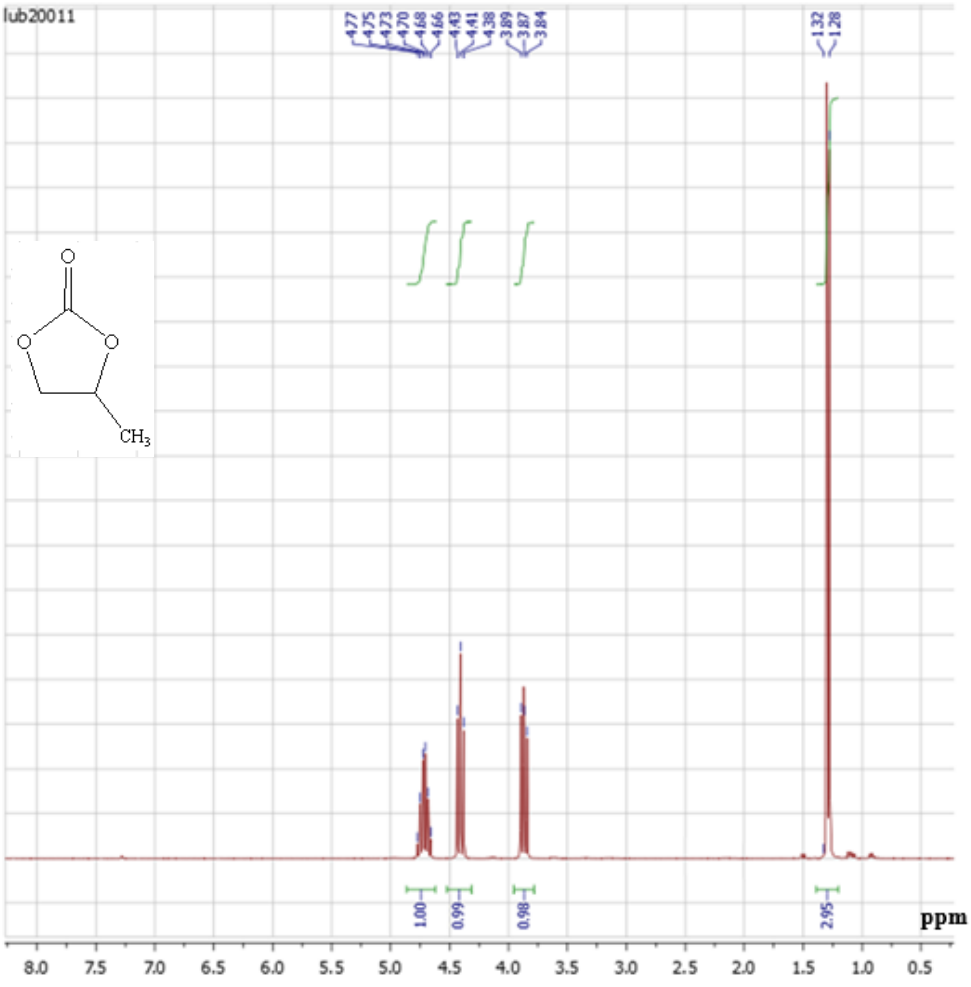

Figure S1. ^{1}H NMR of **2a** in $CDCl_3$.

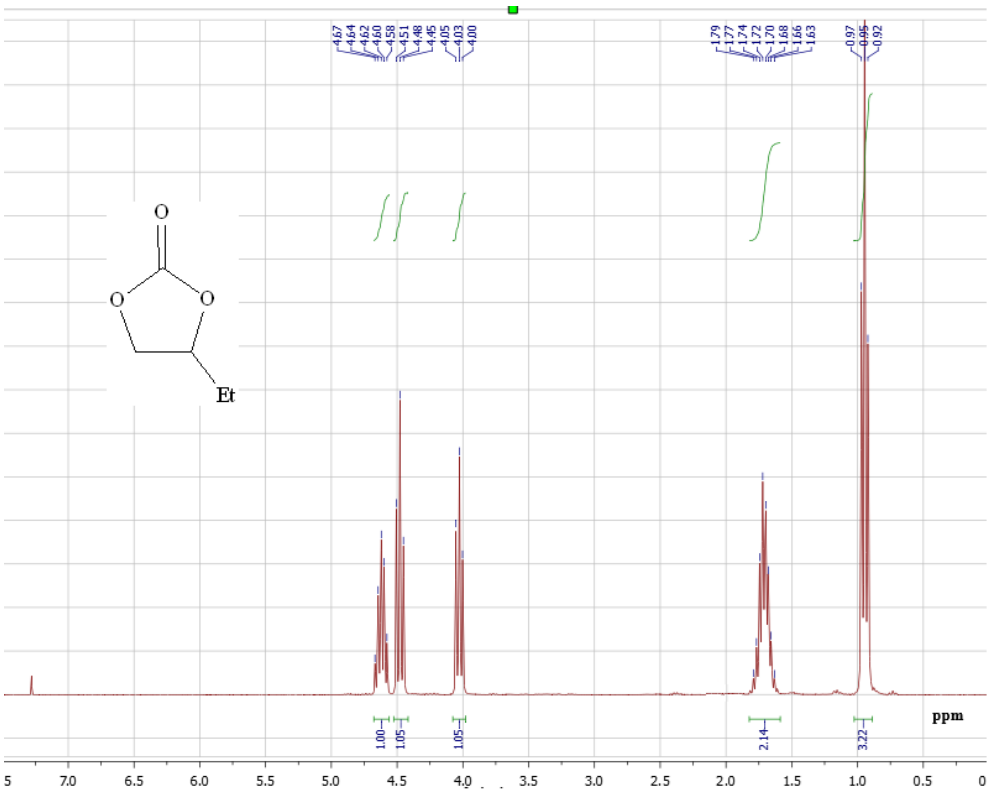

Figure S2. ^{1}H NMR of **2b** in $CDCl_3$.

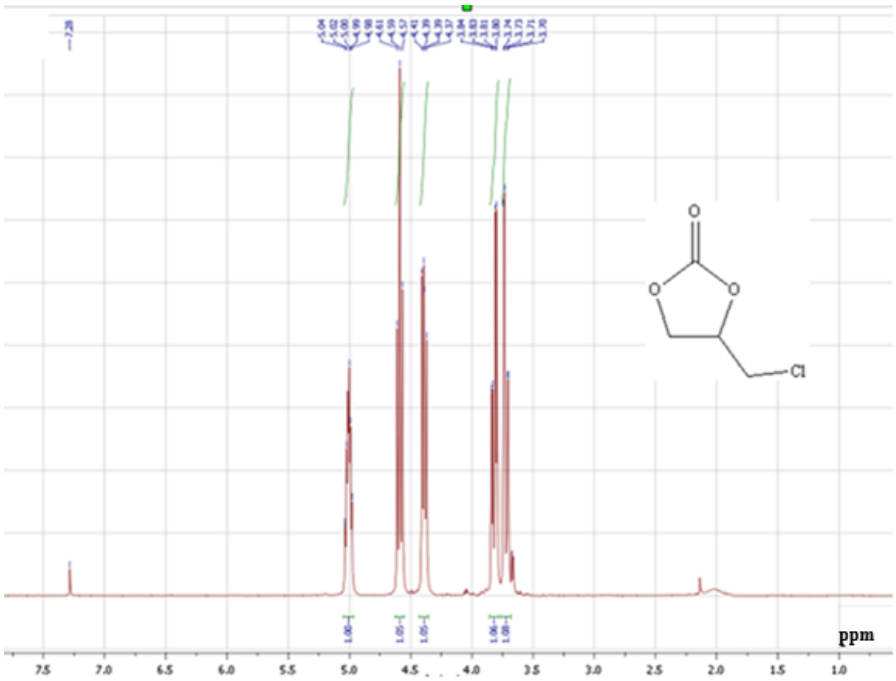

Figure S3. ^{1}H NMR of **2c** in $CDCl_3$.

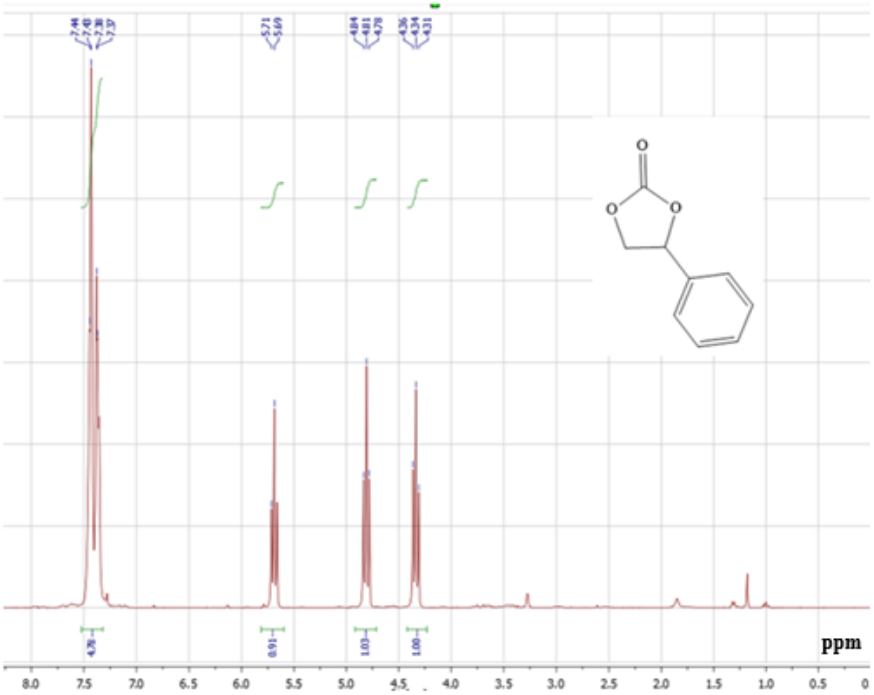

Figure S4. ^{1}H NMR of **2d** in $CDCl_3$.

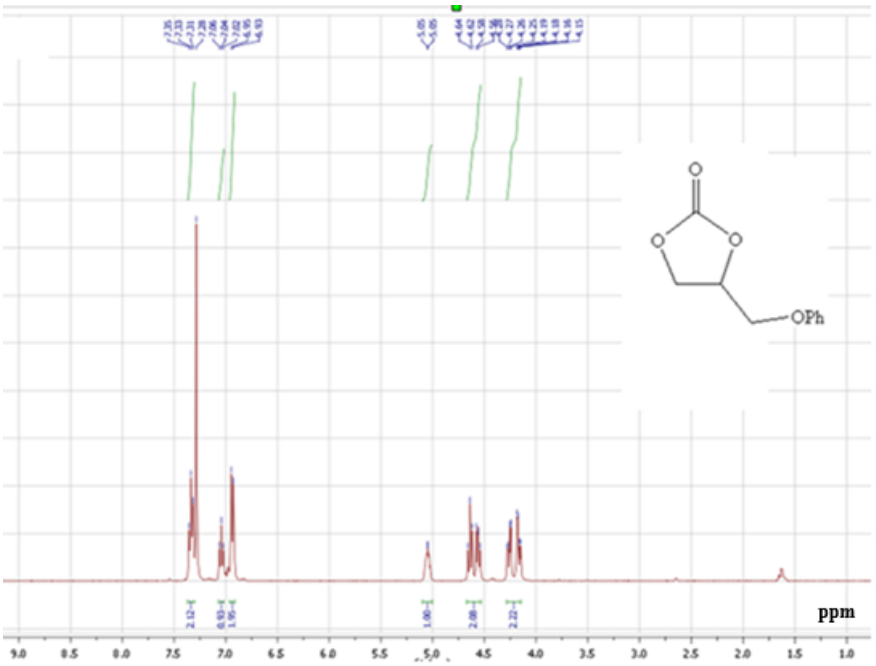

Figure S5. ^{1}H NMR of **2e** in $CDCl_3$.

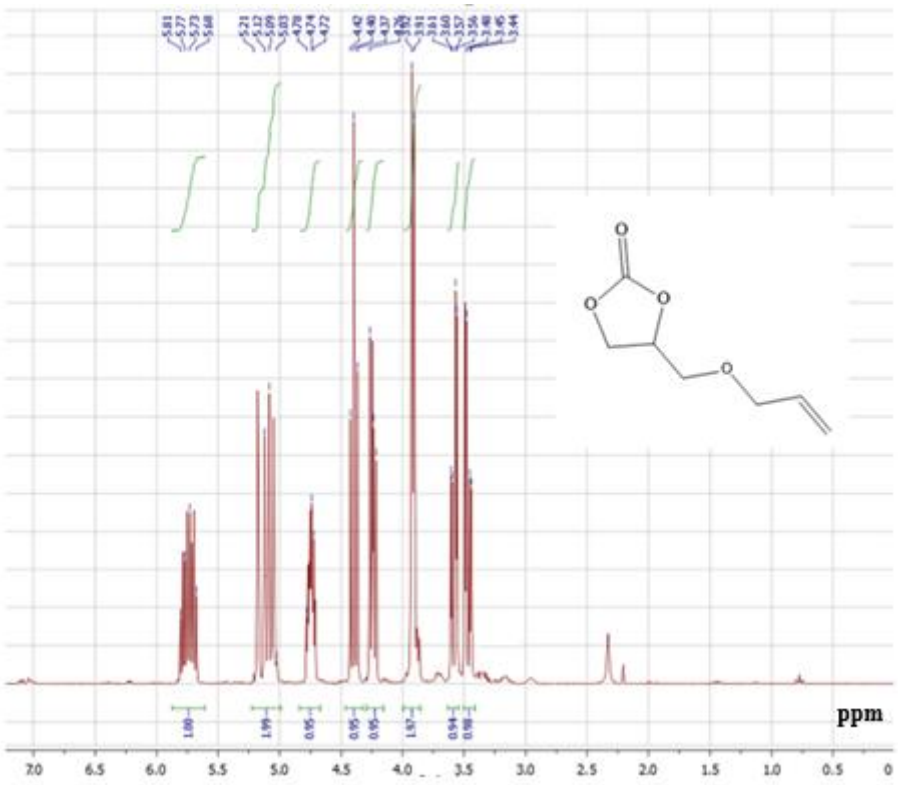

Figure S6. ^{1}H NMR of **2e** in $CDCl_3$.

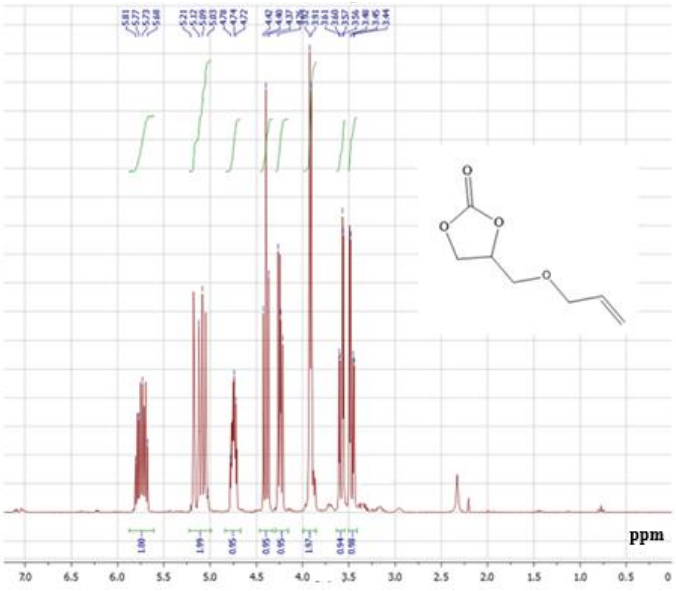

Figure S7. ^{1}H NMR of **2f** in $CDCl_3$.

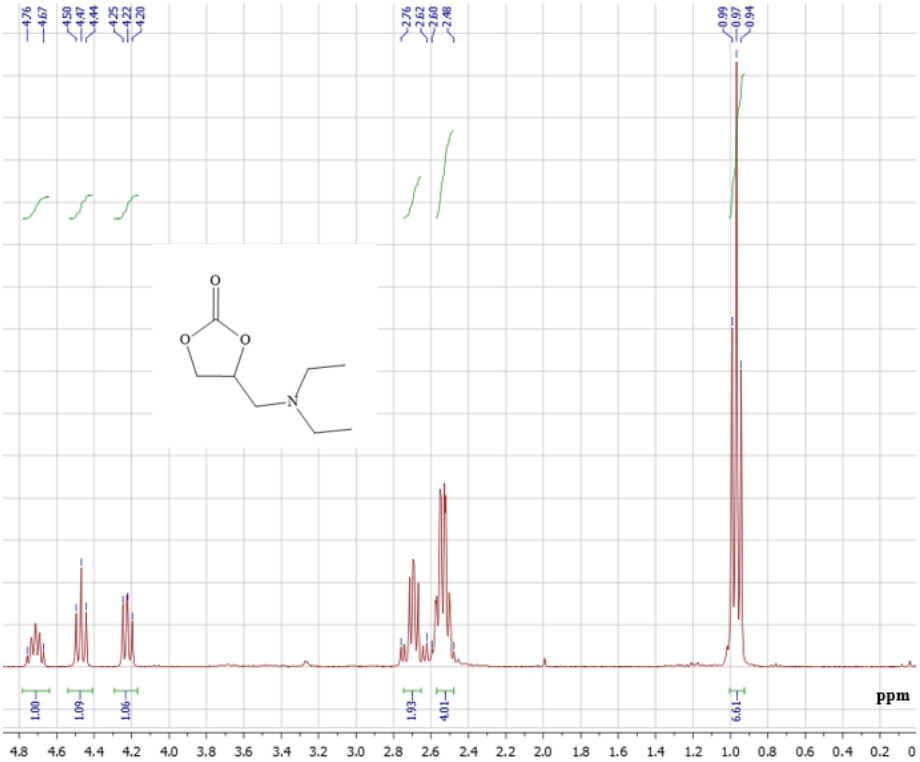

Figure S8. ^{1}H NMR of **2g** in $CDCl_3$.

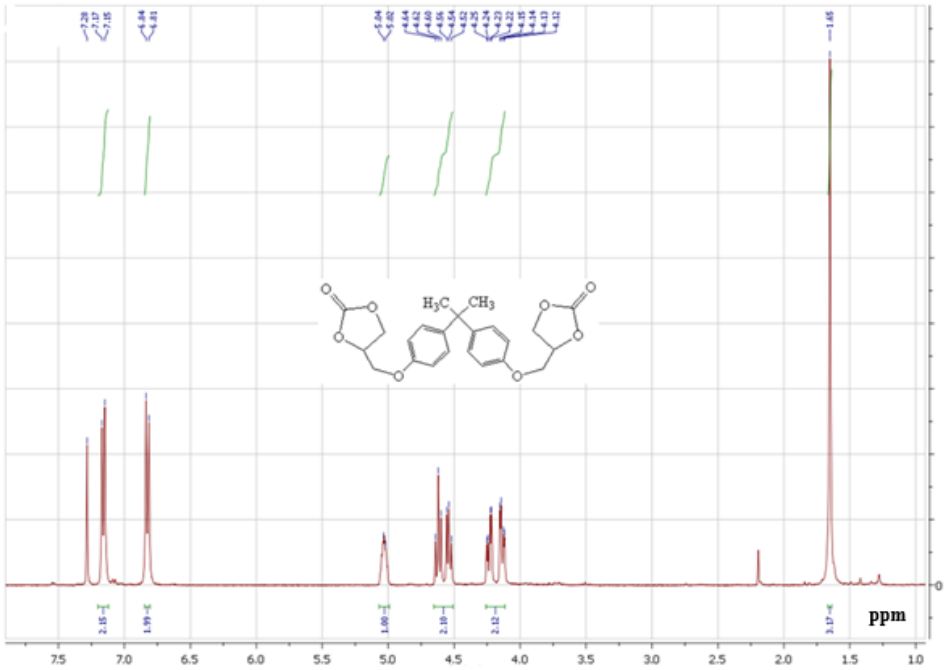

Figure S9. ^{1}H NMR of **4** in $CDCl_3$.