Electronic Supporting Information

Striking dual functionality of the novel Pd@Eu-MOF nanocatalyst in C(sp^2)-C(sp^2) bond-forming and CO_2 fixation reactions

Li-Xin You,[a] Shan-Xin Yao,[a] Bai-Bei Zhao,[a] Gang Xiong,[a] Ileana Dragutan,[b] Valerian Dragutan,*[b] Xue-Gui Liu,[c] Fu Ding[a] and Ya-Guang Sun*[a]

[a]Key Laboratory of Inorganic Molecule-Based Chemistry of Liaoning Province, Shenyang University of Chemical Technology, Shenyang 110142, China. E-mail: sunyaguang@syuct.edu.cn.

[b]Institute of Organic Chemistry, Romanian Academy, Bucharest, P. O. Box 35-108, 060023, Romania. E-mail: vdragutan@yahoo.com.

[c]Institute of Functional Molecules, Shenyang University of Chemical Technology, Shenyang 110142, China

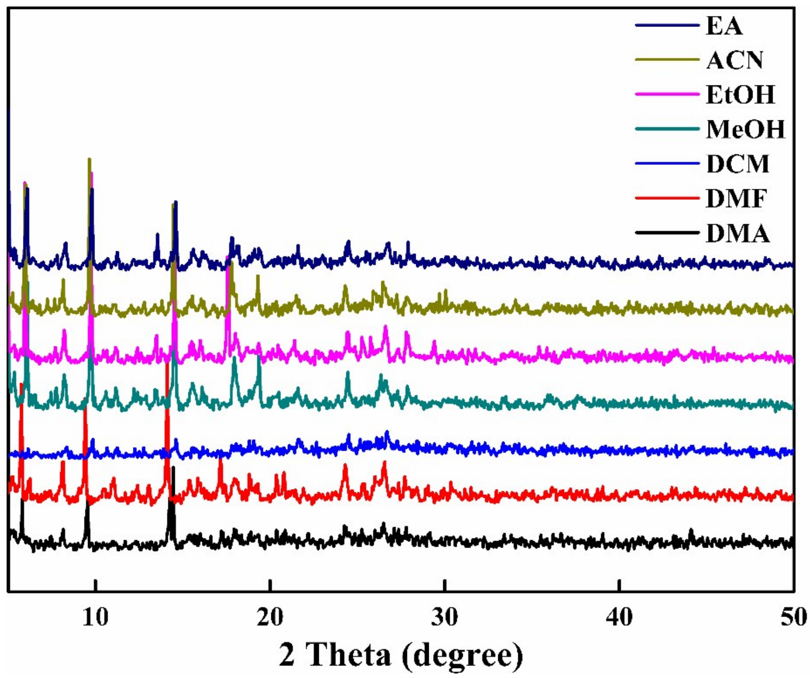


Fig. S1 PXRD of Eu-MOF after being suspended in different solvents for 12 h.

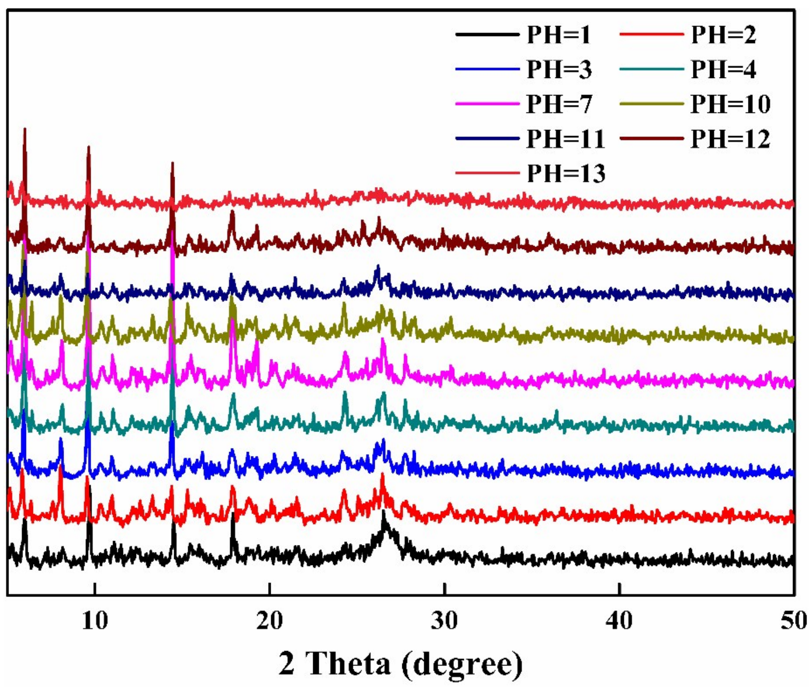


Fig. S2 PXRD of Eu-MOF after being suspended in aqueous sodium hydroxide and hydrochloric conditions, under specific pH value for 12 h.

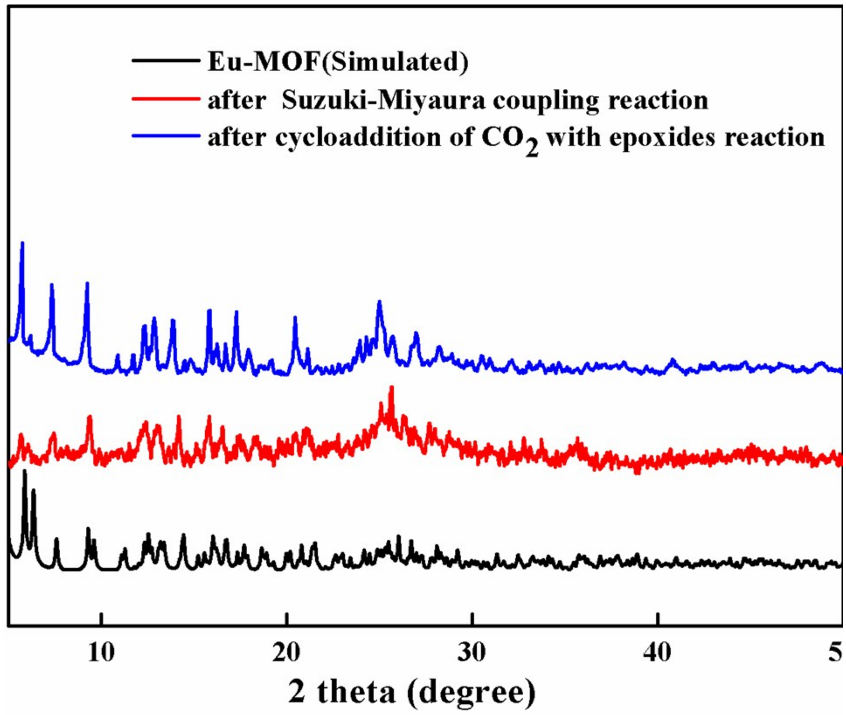


Fig. S3 PXRD of Pd@Eu-MOF after the Suzuki-Miyaura coupling and cycloaddition of CO_2 with epoxide.

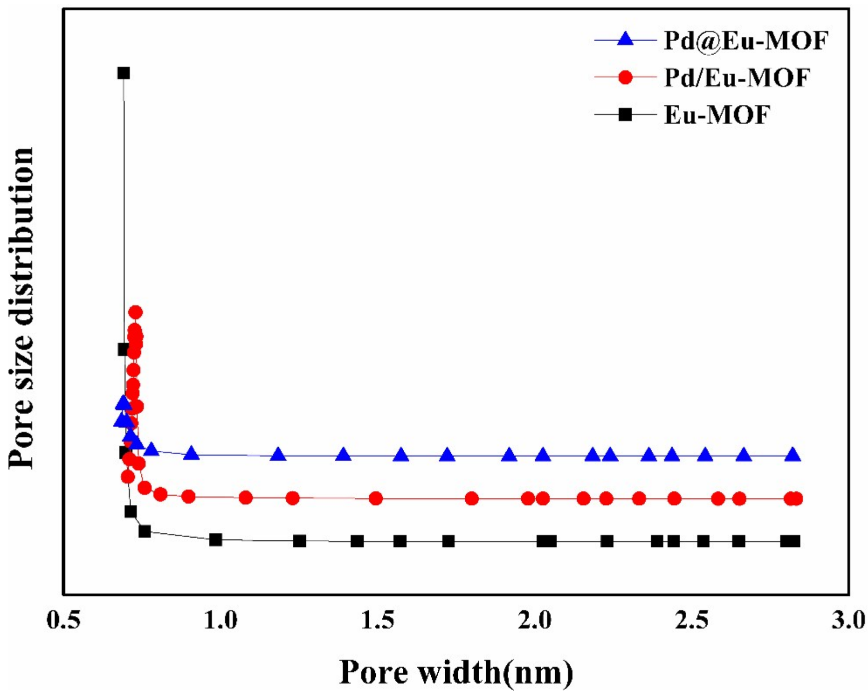


Fig. S4 Pore size distribution of Pd@Eu-MOF, Pd/Eu-MOF and Eu-MOF.

Table S1 Langmuir surface area of Eu-MOF, Pd/Eu-MOF and Pd@Eu-MOF.

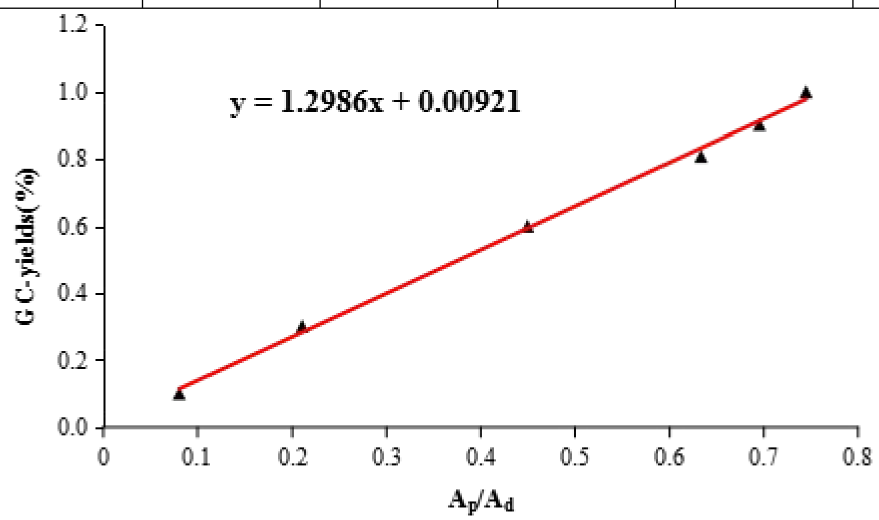
Sample	Eu-MOF	Pd/Eu-MOF	Pd@Eu-MOF
Langmuir surface area (m^2/g)	1361.22	1293.87	705.87

GC-yield Standard Plots

GC-yield standard curve of biphenyl

The response peak area ratios of the product and the internal standard *n*-hexadecane (Ap/Ad) were obtained from Agilent 7890A GC spectrometer.

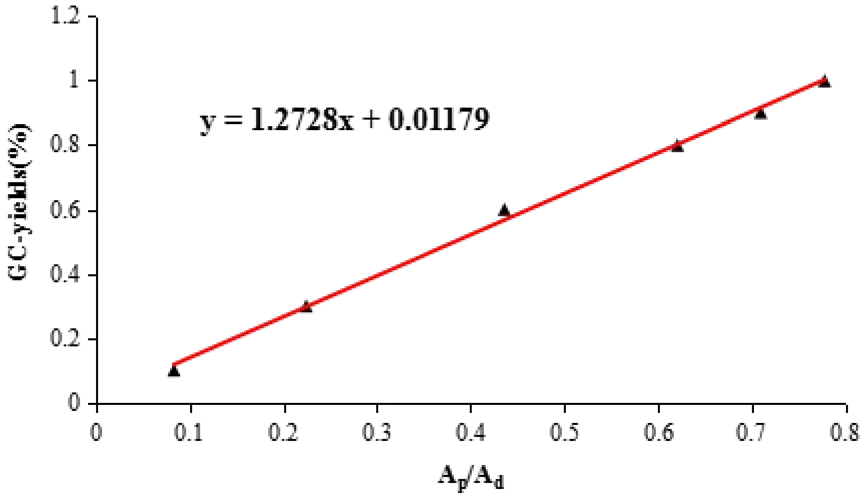
A_p/A_d	0.0806	0.2106	0.4497	0.6333	0.6953	0.7448
Yields	0.1	0.30	0.60	0.81	0.90	1.00



GC-yield standard curve of 4-methoxybiphenyl

The response peak area ratios of the product and the internal standard *n*-hexadecane (Ap/Ad) were obtained from Agilent 7890A GC spectrometer.

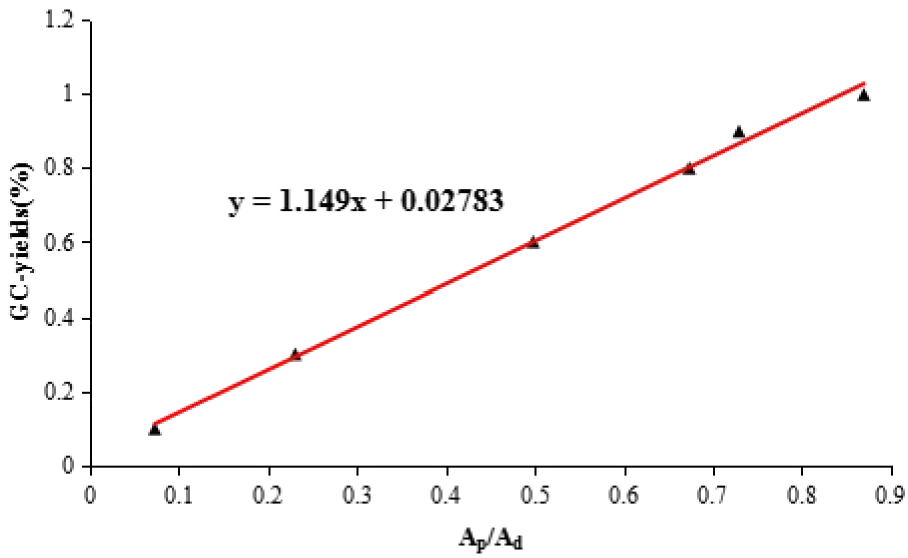
A_p/A_d	0.0833	0.2243	0.4362	0.6207	0.7095	0.7776
Yields	0.1	0.30	0.60	0.80	0.90	1.00



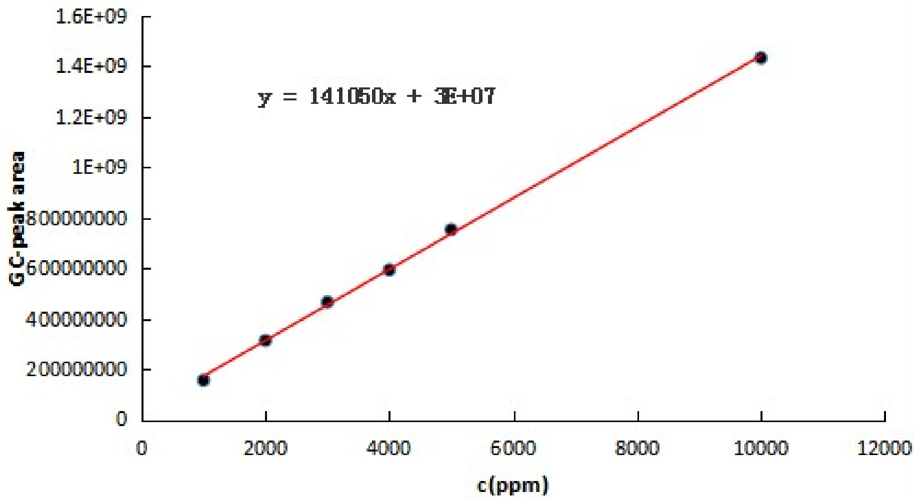
GC-yield standard curve of 4-phenylacetophenone

The response peak area ratios of the product and the internal standard *n*-hexadecane (Ap/Ad) were obtained from Agilent 7890A GC spectrometer.

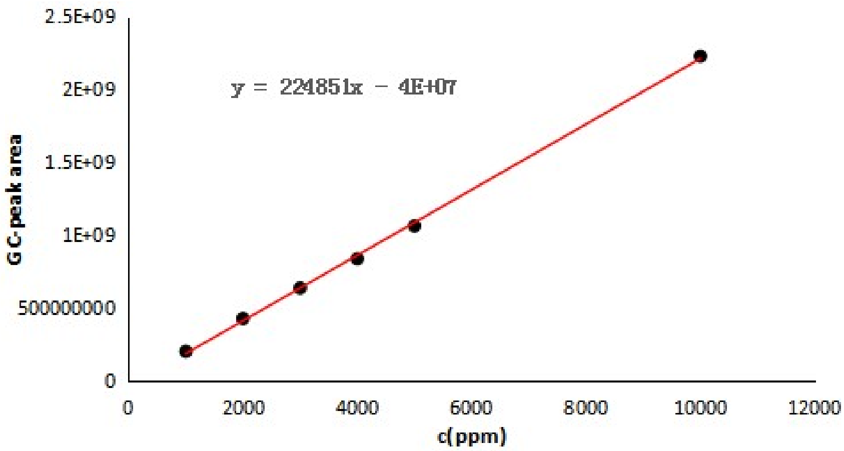
A_p/A_d	0.0730	0.2305	0.4982	0.6735	0.7293	0.8697
Yields	0.1	0.30	0.60	0.80	0.90	1.00



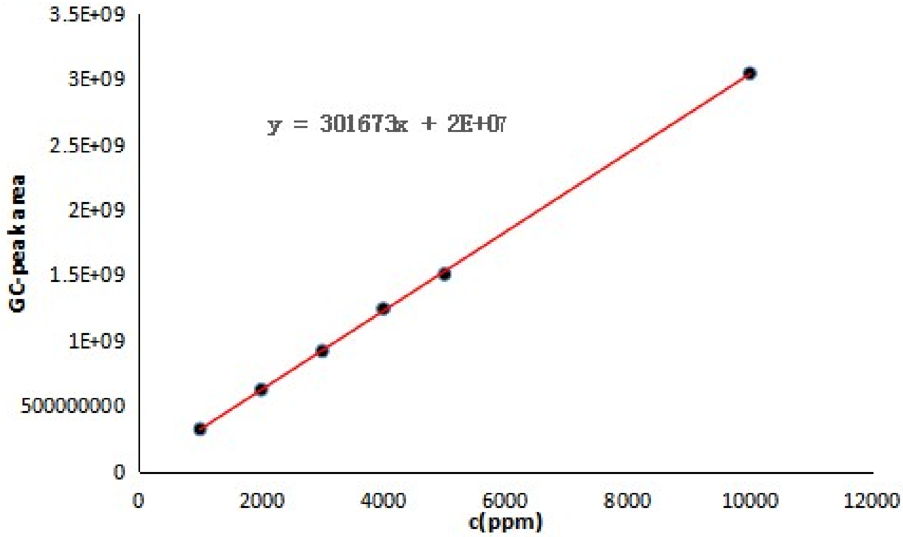
GC-yield standard curve of 4-chloromethyl-1,3-dioxolan-2-one



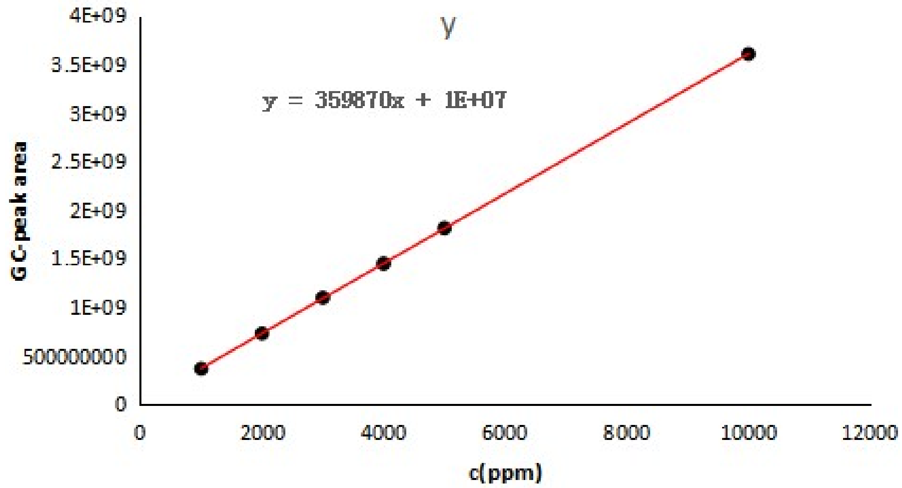
GC-yield standard curve of 4-methyl-1,3-dioxolan-2-one



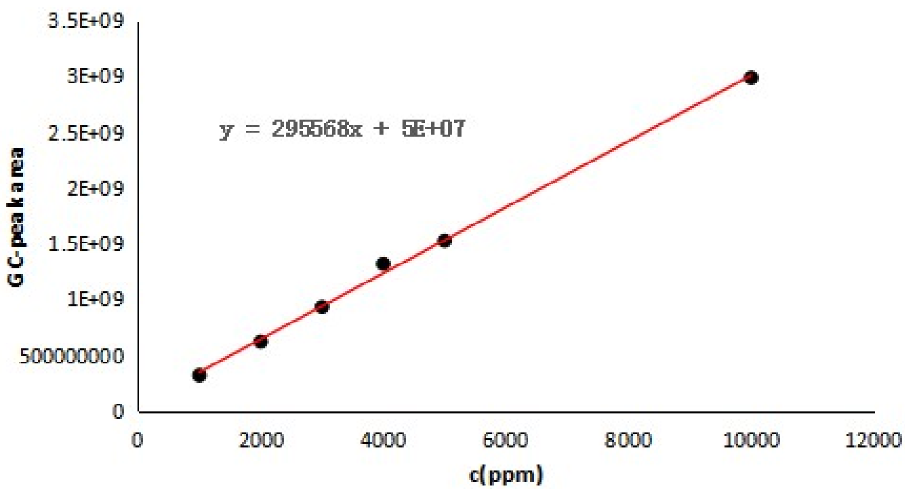
GC-yield standard curve of 4-ethyl-1,3-dioxolan-2-one



GC-yield standard curve of 4-phenyl-1,3-dioxolan-2-one

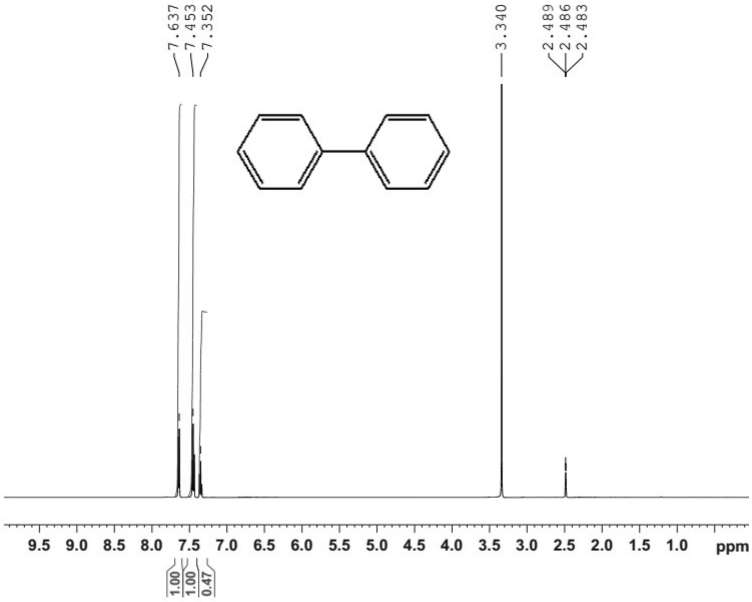


GC-yield standard curve of 4-butyl-1,3-dioxolan-2-one

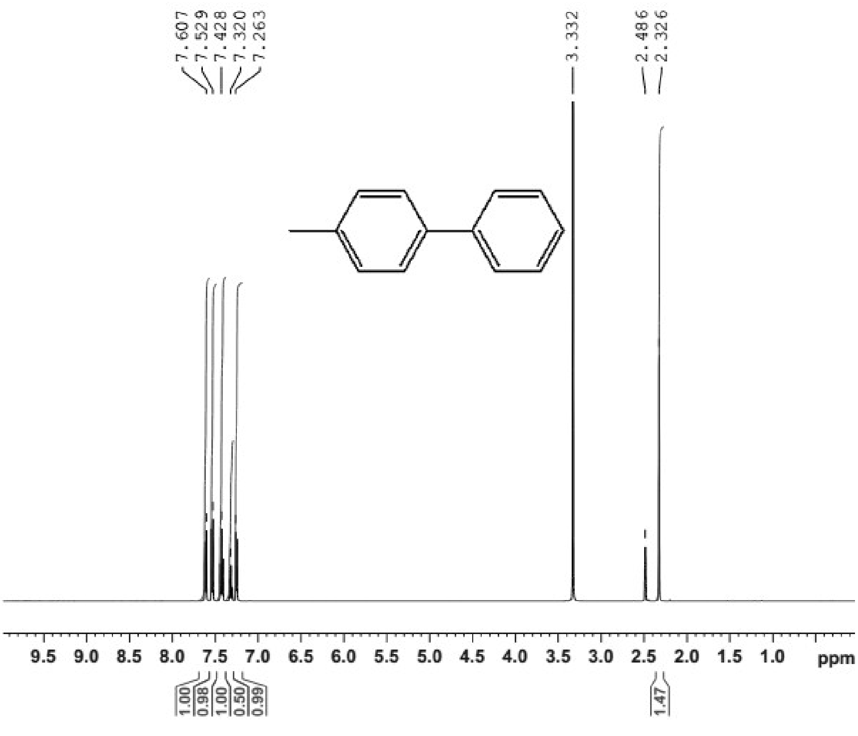


[1]HNMR spectra of products

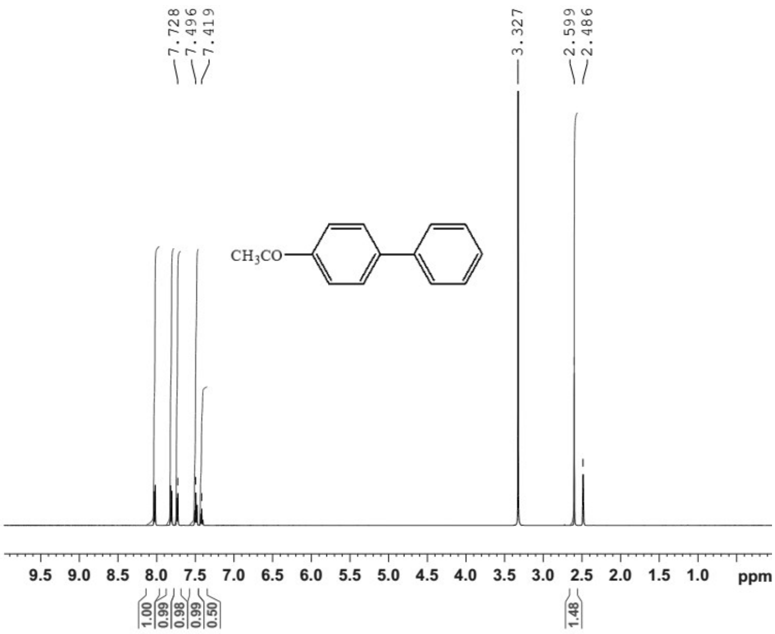
Biphenyl: ^{1}H NMR (500 MHz, d6-DMSO): δ = 7.35 (t, 2H), 7.45(t, 4H), 7.64 (d, 4H).



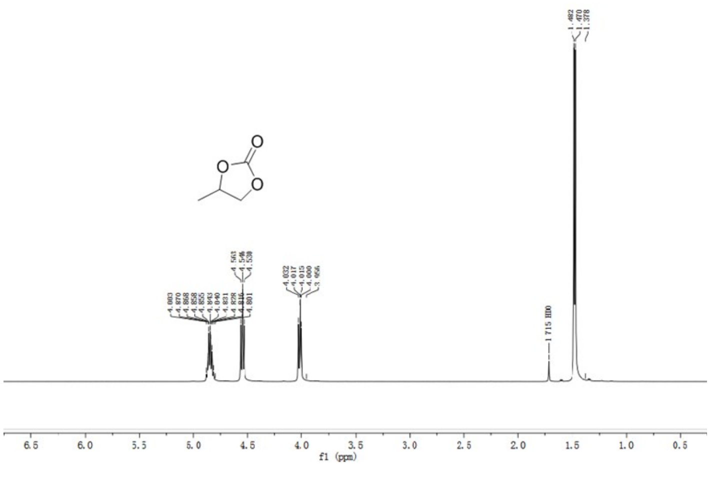
4-Methyl-1,1'-biphenyl: ^{1}H NMR (500 MHz, d6-DMSO): δ = 2.33 (s, 3H), 7.26 (d, 2H), 7.32 (t, 1H), 7.43 (t, 2H), 7.53 (d, 2H), 7.61 (d, 2H).



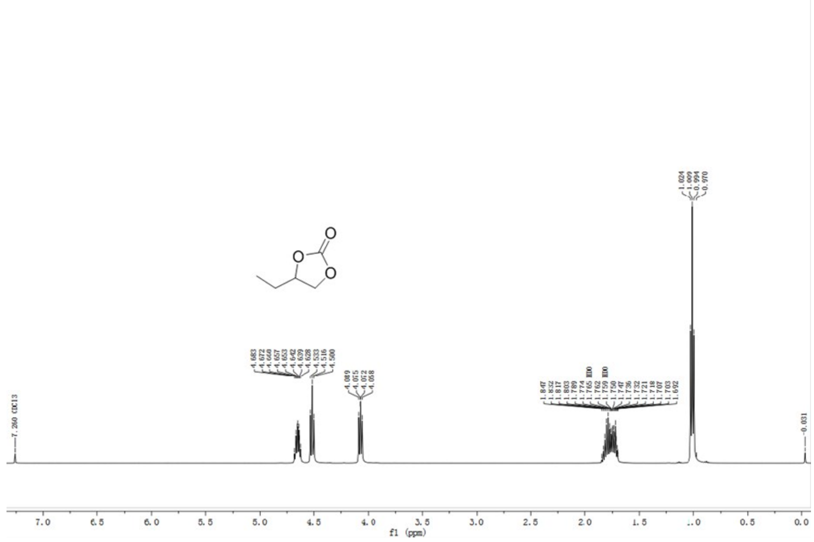
4-Acetyl-1,1'-biphenyl: [1]H NMR (500 MHz, d6-DMSO): δ = 2.60 (s, 3H), 7.42 (t, 2H), 7.50 (t, 2H), 7.73 (d, 2H), 7.82 (d, 2H), 8.03(d, 2H)



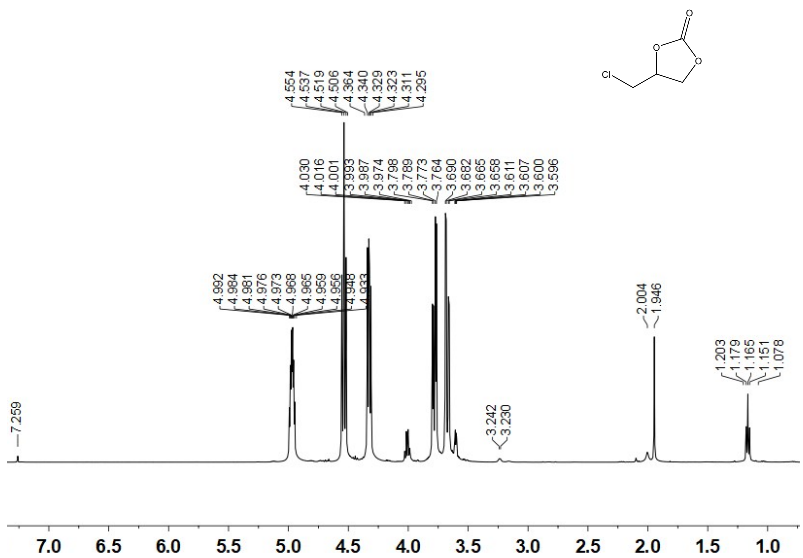
4-Methyl-1,3-dioxolan-2-one: [1]H NMR (500 MHz, $CDCl_3$);δ=1.47 (d, 3H), 4.01(t, 1H), 4.55(t, 1H), 4.84(m, 1H)



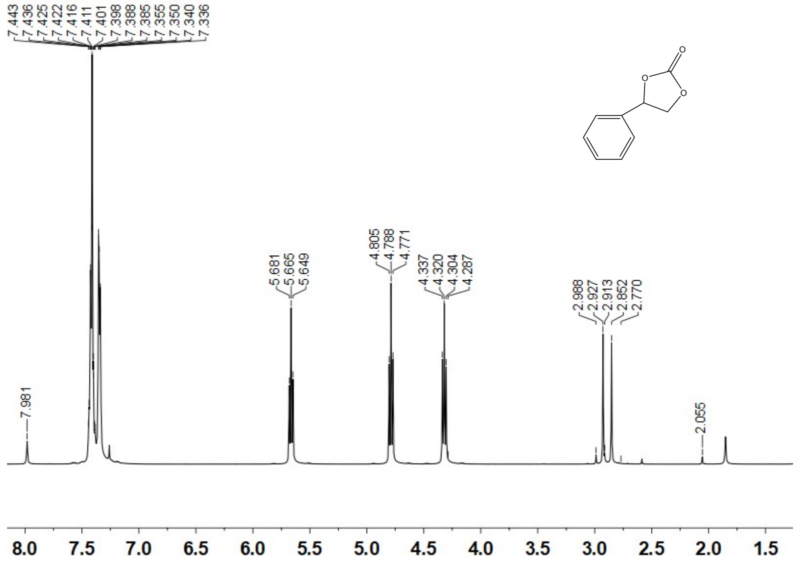
4-Ethyl-1,3-dioxolan-2-one: ^{1}H NMR (500 MHz, $CDCl_3$) δ=0.99 (t,3H), 1.75(m,2H), 4.08 (dd,1H), 4.5 (t,1H), 4.65(m,1H).



4-Chloromethyl-1,3-dioxolan-2-one: ^{1}H NMR (500 MHz, $CDCl_3$): δ=3.72 (m,2H), 4.33 (dd,1H),4.54 (t,1H),4.98 (m, 1H)



4-Phenyl-1,3-dioxolan-2-one: ^{1}H NMR (500 MHz, $CDCl_3$); 4.32 (t, 1H), 4.79 (t, 1H) 5.66 (t, 1H) 7.41(m, 5H)



4-Butyl-1,3-dioxolan-2-one:^{1}H NMR (500 MHz, $CDCl_3$) δ=0.81(t, 3H), 1.27 (m, 4H), 1.64 (m, 2H), 3.99(dd, 1H), 4.46 (t, 1H),4.62(m, 1H)