Supplementary Information:

Effectively synthesis of diethyl carbonate from ethyl carbamate and ethanol using Mg-Y composite oxides

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†Electronic Supplementary Information (ESI) available. See DOI: 10.1039/b000000x
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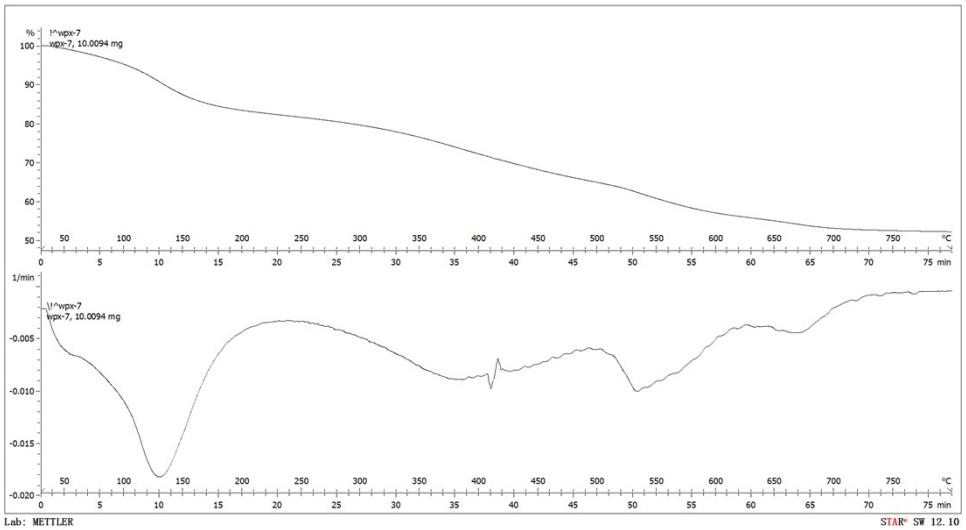


Fig. S1 The DTG curve of HTMgY precipitation.

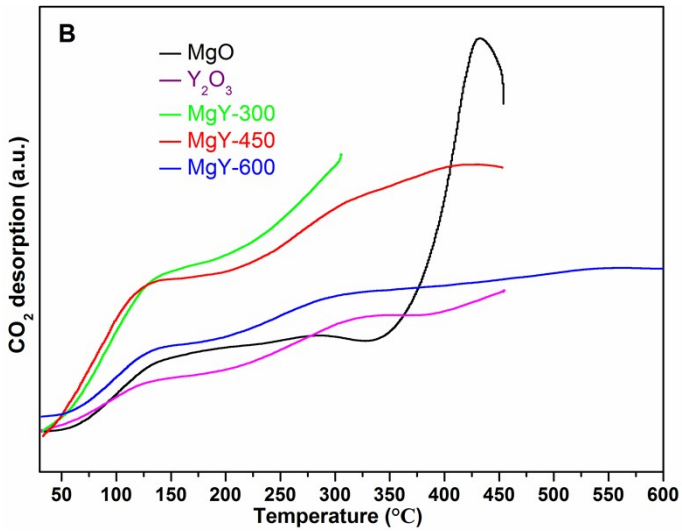


Fig. S2 CO_2-TPD profiles of MgO, Y_2O_3, MgY-300, MgY-450, MgY-600. Temperature and signal relationship diagram (the desorption profile was recorded from room temperature to pretreated temperature)

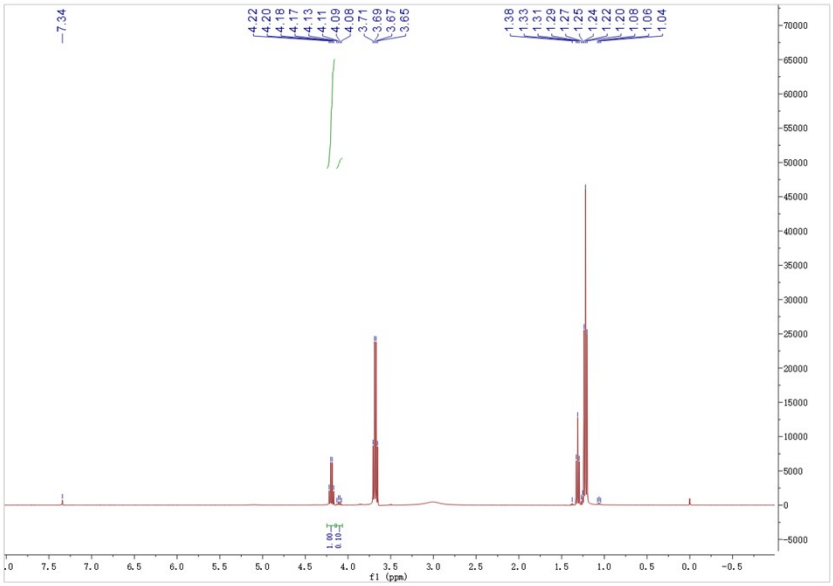


Fig.S3 ^{1}H NMR spectra of the reaction mixture ($DCCl_3$, 400 MHz, 25 °C).

C_2H_5OH: δ=1.20, 1.22, 1.24 (3H), δ=3.65, 3.67, 3.69, 3.71 (2H), δ = 4.2 (1H);
DEC: δ=1.33, 1.31, 1.29 (6H), δ=4.22, 4.20, 4.18, 4.17 (4H);
EC: δ=1.27, 1.25 (3H), δ=4.13, 4.11, 4.09, 4.08 (2H).

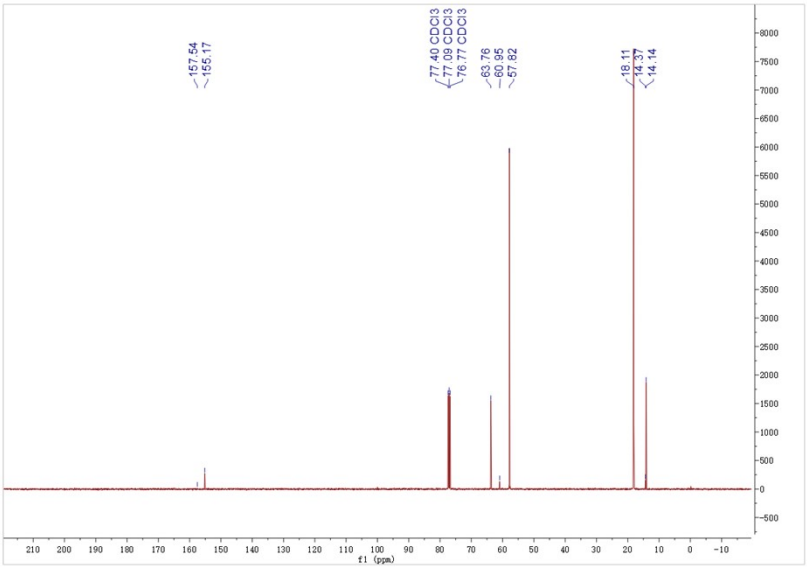
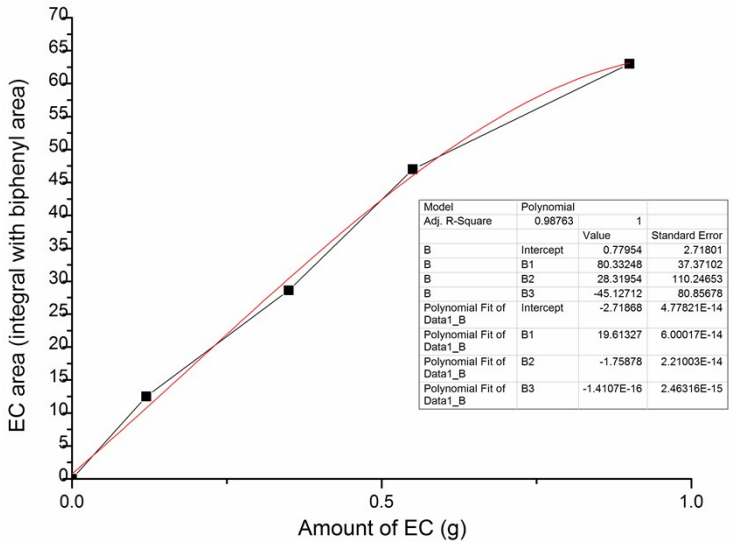


Fig.S4 ^{13}C NMR spectra of the reaction mixture ($DCCl_3$, 400 MHz, 25 °C).

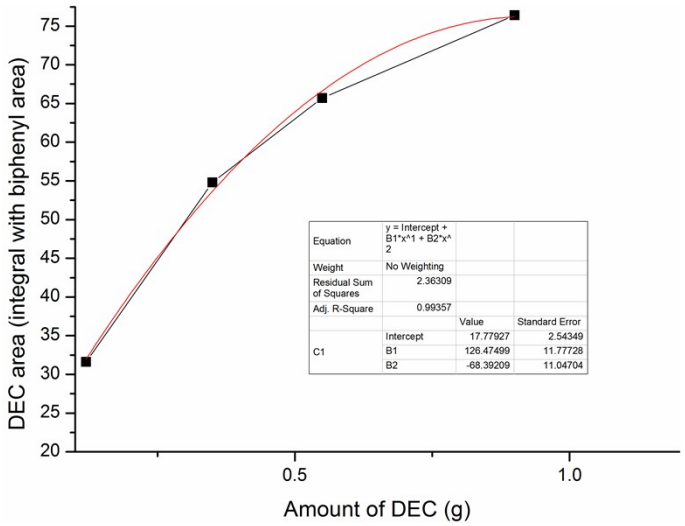
C_2H_5OH: δ=7.82,18.11;
DEC: δ=14.14, 63.76, 155.17;
EC: δ=14.37, 60.95, 157.54.

EC, DEC standard curve and GC curve in Table 3



Model	Polynomial		
Adj. R-Square	0.98763	1	
		Value	Standard Error
B	Intercept	0.77954	2.71801
B	B1	80.33248	37.37102
B	B2	28.31954	110.24653
B	B3	-45.12712	80.85678
Polynomial Fit of Data1_B	Intercept	-2.71868	4.77821E-14
Polynomial Fit of Data1_B	B1	19.61327	6.00017E-14
Polynomial Fit of Data1_B	B2	-1.75878	2.21003E-14
Polynomial Fit of Data1_B	B3	-1.4107E-16	2.46316E-15

Fig.S5 The standard curve of EC uses 0.1g biphenyl as the internal standard



Equation	y = Intercept + B1*x^1 + B2*x^2		
Weight	No Weighting		
Residual Sum of Squares	2.36309		
Adj. R-Square	0.99357		
		Value	Standard Error
C1	Intercept	17.77927	2.54349
	B1	126.47499	11.77728
	B2	-68.39209	11.04704

Fig.S6 The standard curve of DEC uses 0.1g biphenyl as the internal standard

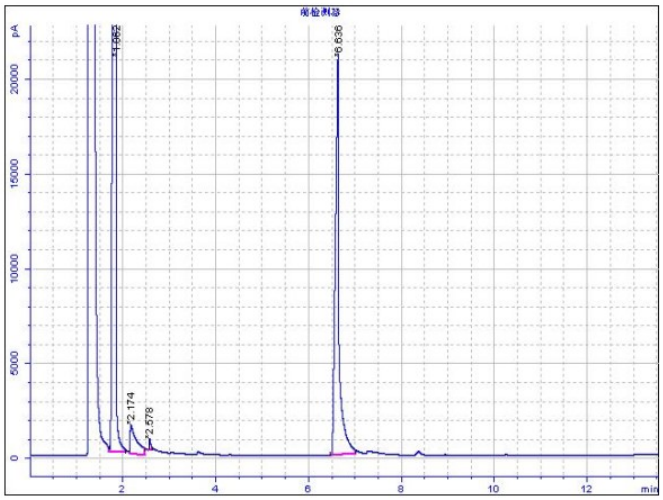


Fig.S7 Gas chromatography of DEC synthesis using MgY-450 catalyst, DEC (1.8min), EC (2.1min), NEEC (2.5min), biphenyl (6.6min)

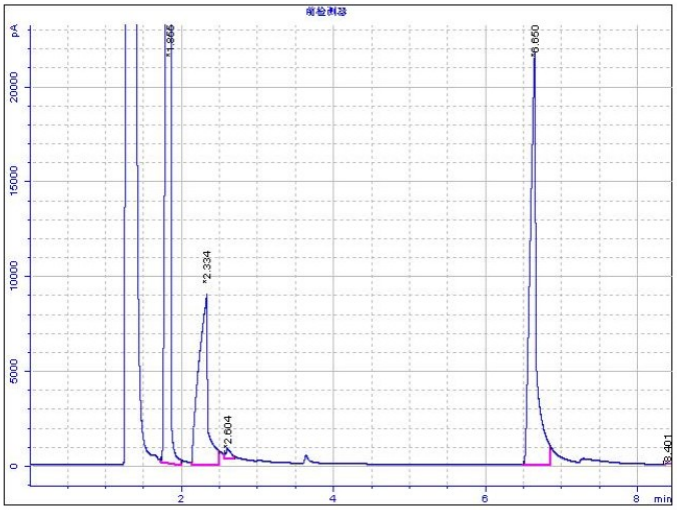


Fig.S8 Gas chromatography of DEC synthesis using MgY-300 catalyst, DEC (1.8min), EC (2.3min), NEEC (2.6min), biphenyl (6.6min)

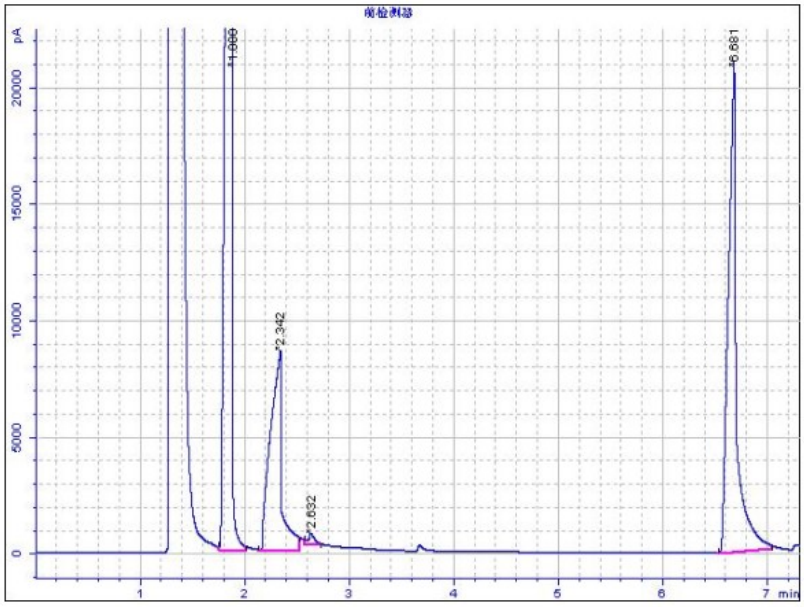


Fig.S9 Gas chromatography of DEC synthesis using MgY-600 catalyst, DEC (1.8min), EC (2.3min), NEEC (2.6min), biphenyl (6.6min)

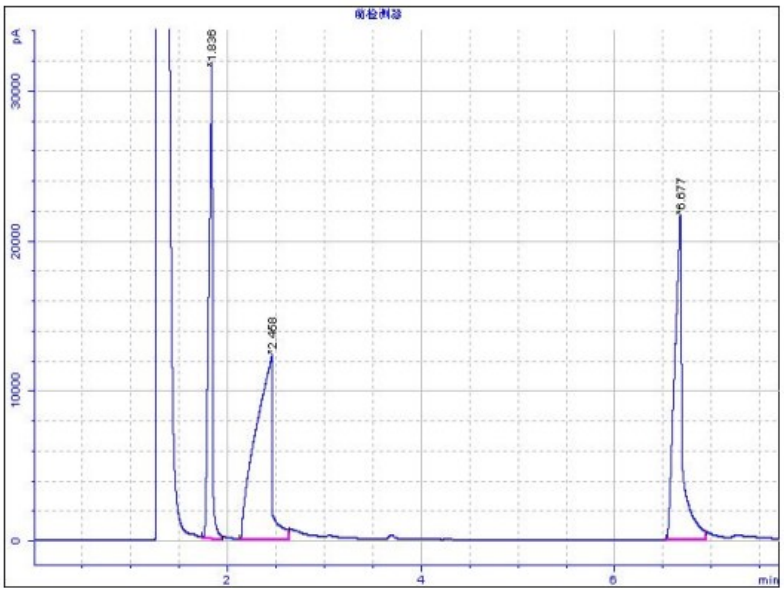


Fig.S10 Gas chromatography of DEC synthesis without catalyst, DEC (1.8min), EC (2.4min), NEEC (2.5min), biphenyl (6.6min)

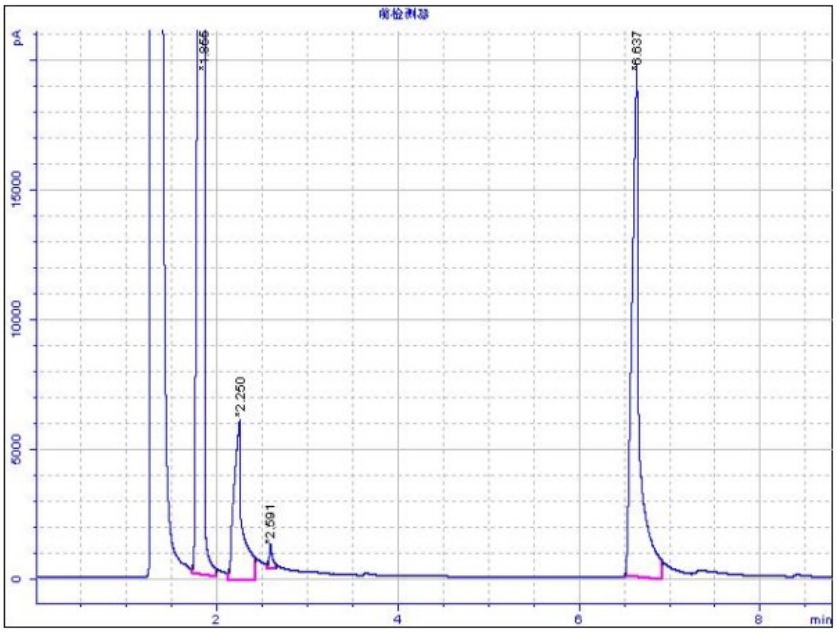


Fig.S11 Gas chromatography of DEC synthesis using MgO catalyst, DEC (1.8min), EC (2.2min), NEEC (2.5min), biphenyl (6.6min)

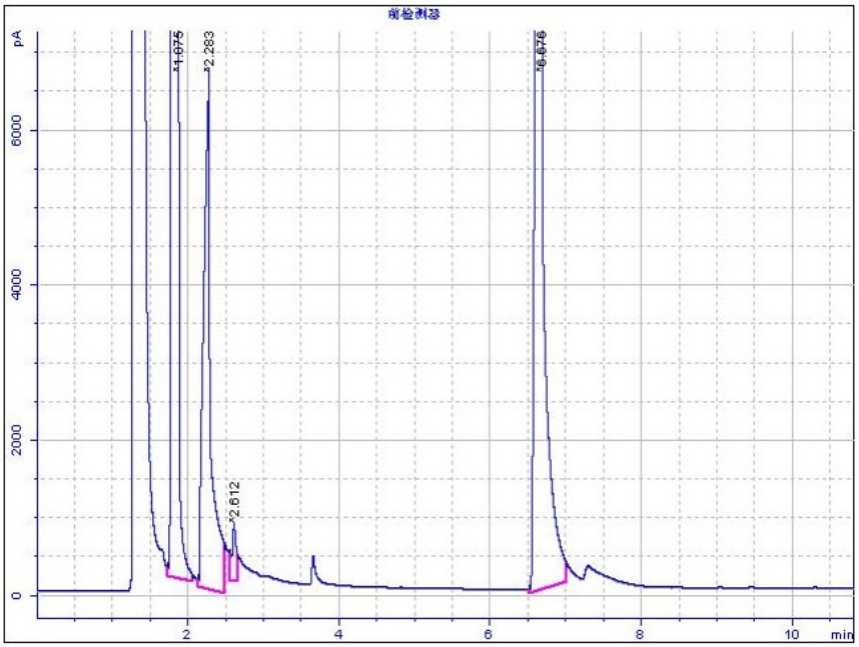


Fig.S12 Gas chromatography of DEC synthesis using MgO+Y_2O_3 catalyst, DEC (1.8min), EC (2.3min), NEEC (2.6min), biphenyl (6.6min)

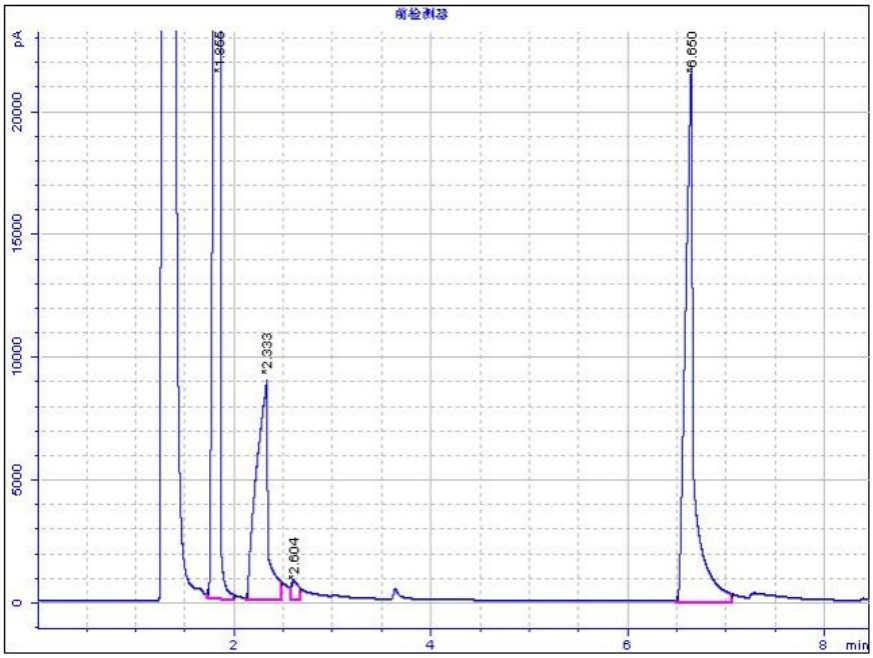


Fig.S13 Gas chromatography of DEC synthesis using Y_2O_3 catalyst, DEC (1.8min), EC (2.3min), NEEC (2.6min), biphenyl (6.6min)

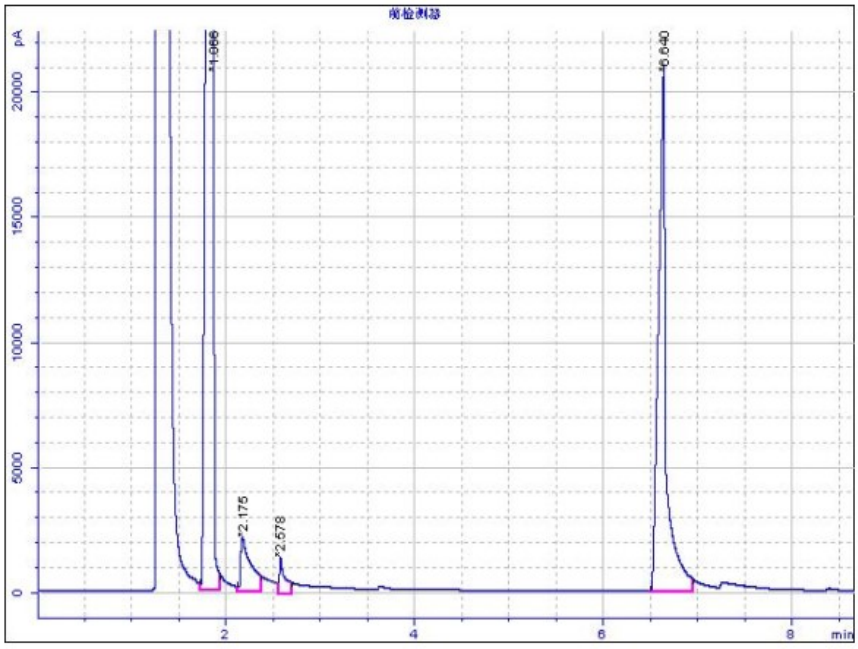


Fig.S14 Gas chromatography of DEC synthesis using MgY-450^{1st} catalyst, DEC (1.8min), EC (2.3min), NEEC (2.6min), biphenyl (6.6min)

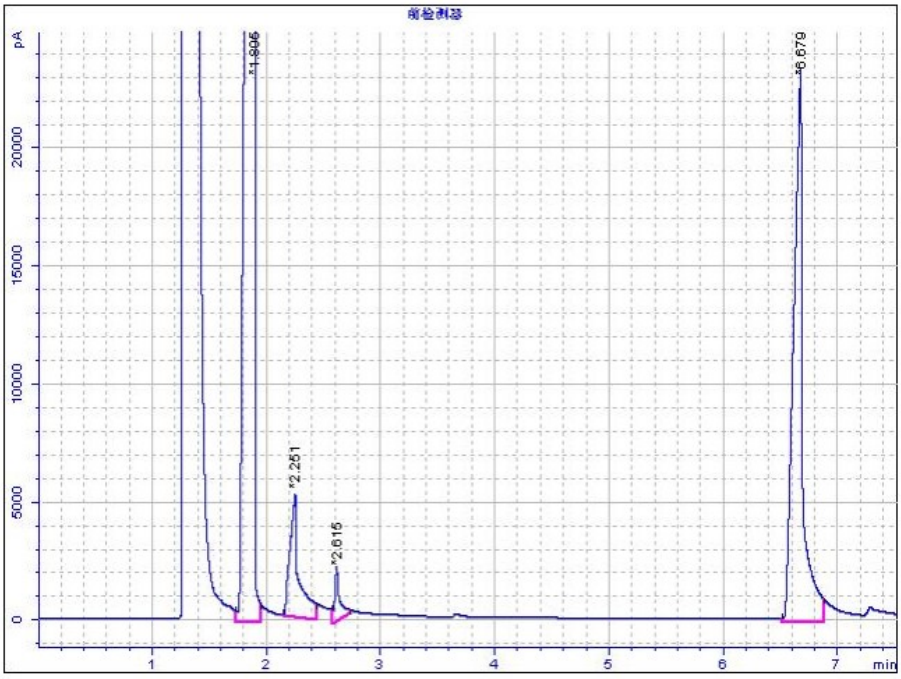


Fig.S15 Gas chromatography of DEC synthesis using MgY-450^{2nd} catalyst, DEC (1.8min), EC (2.2min), NEEC (2.6min), biphenyl (6.6min)

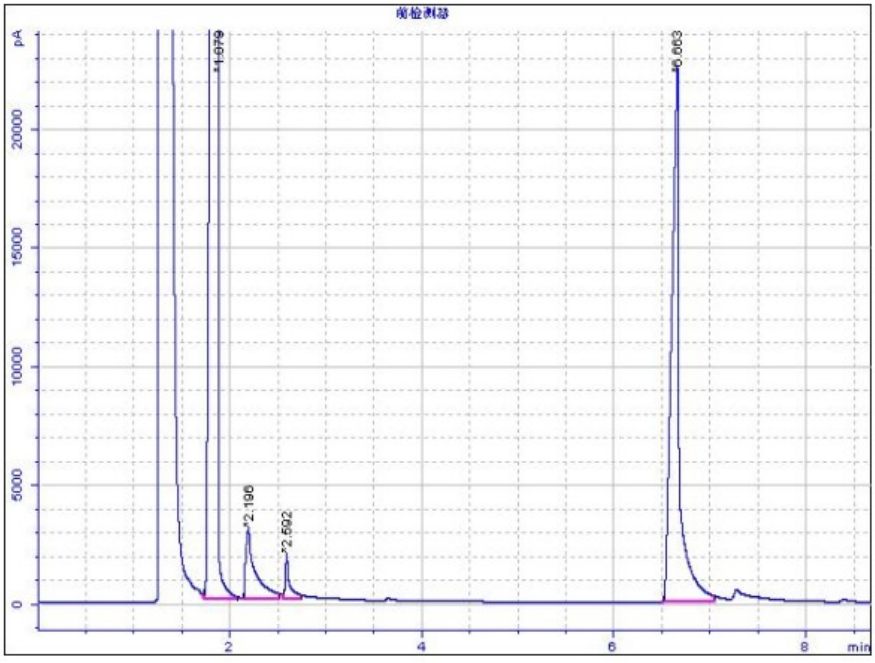


Fig.S16 Gas chromatography of DEC synthesis using MgY-450^{3rd} catalyst, DEC (1.8min), EC (2.2min), NEEC (2.6min), biphenyl (6.6min)