

Metal-free catalytic conversion of CO₂ and glycerol to glycerol carbonate

Xinluona Su,^{a,b,c} Weiwei Lin,^{*a,b} Haiyang Cheng,^{a,b} Chao Zhang,^{a,b} Ying Wang,^{*d} Xiujuan Yu,^c Zhijian Wu^d and Fengyu Zhao^{*a,b}

^aState Key Laboratory of Electroanalytical Chemistry, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun 130022 P.R. China

E-mail: zhaofy@ciac.ac.cn; linwei@ciac.ac.cn; Fax&Tel.: +86-431-8526-2410;

^bLaboratory of Green Chemistry and Process, Changchun Institute of Applied chemistry, Chinese Academy of Sciences, Changchun 130022 P.R. China

^cDepartment of Environmental Science and Engineering, Heilongjiang University, Harbin, 150080, P.R. China

^dState Key Laboratory of Rare Earth Resource Utilization, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun 130022, P.R. China

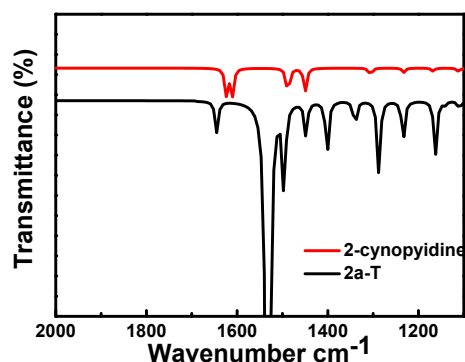


Fig.S1 The calculated IR spectrum of 2a-T (in black) and 2-cyanopyridine (in red).

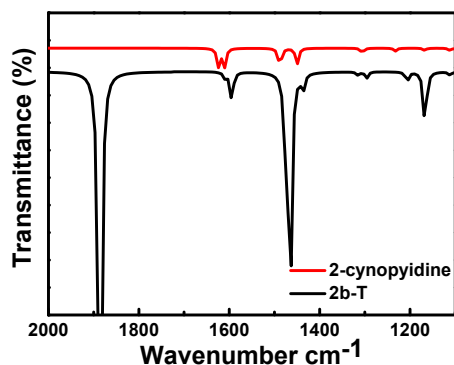


Fig.S2 The calculated IR spectrum of 2b-T (in black) and 2-cyanopyridine (in red).

Table S1 Effect of the solvent on the carbonate synthesis from CO₂ and glycerol

Entry	solvent	Conversion(%)	GC Yield (%)
1	DMF	23.3	10.1
2	NMP	18.4	11.6
3	acetone	22	5.6
4	Hexane	32.1	9.2
5	no solvent	31.1	11.4

Reaction conditions: glycerol 1.15 g, 2-Cyanopyridine/glycerol=2:1, solvent 2 mL, CO₂ 10 MPa, 170 °C, 12 h.

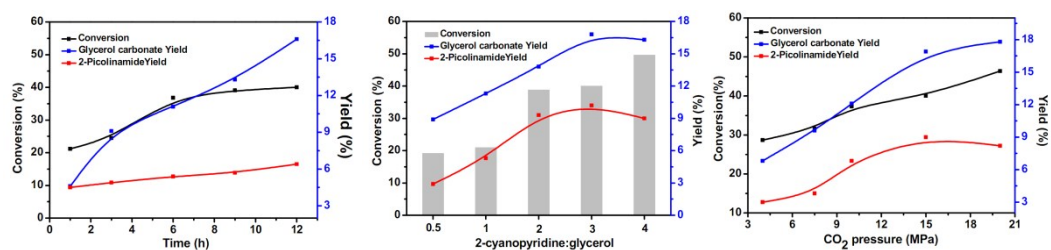


Fig. S3 Effect of CO₂ pressure, amount of 2-cyanopyridine and reaction time on carbonylation of glycerol with CO₂.