

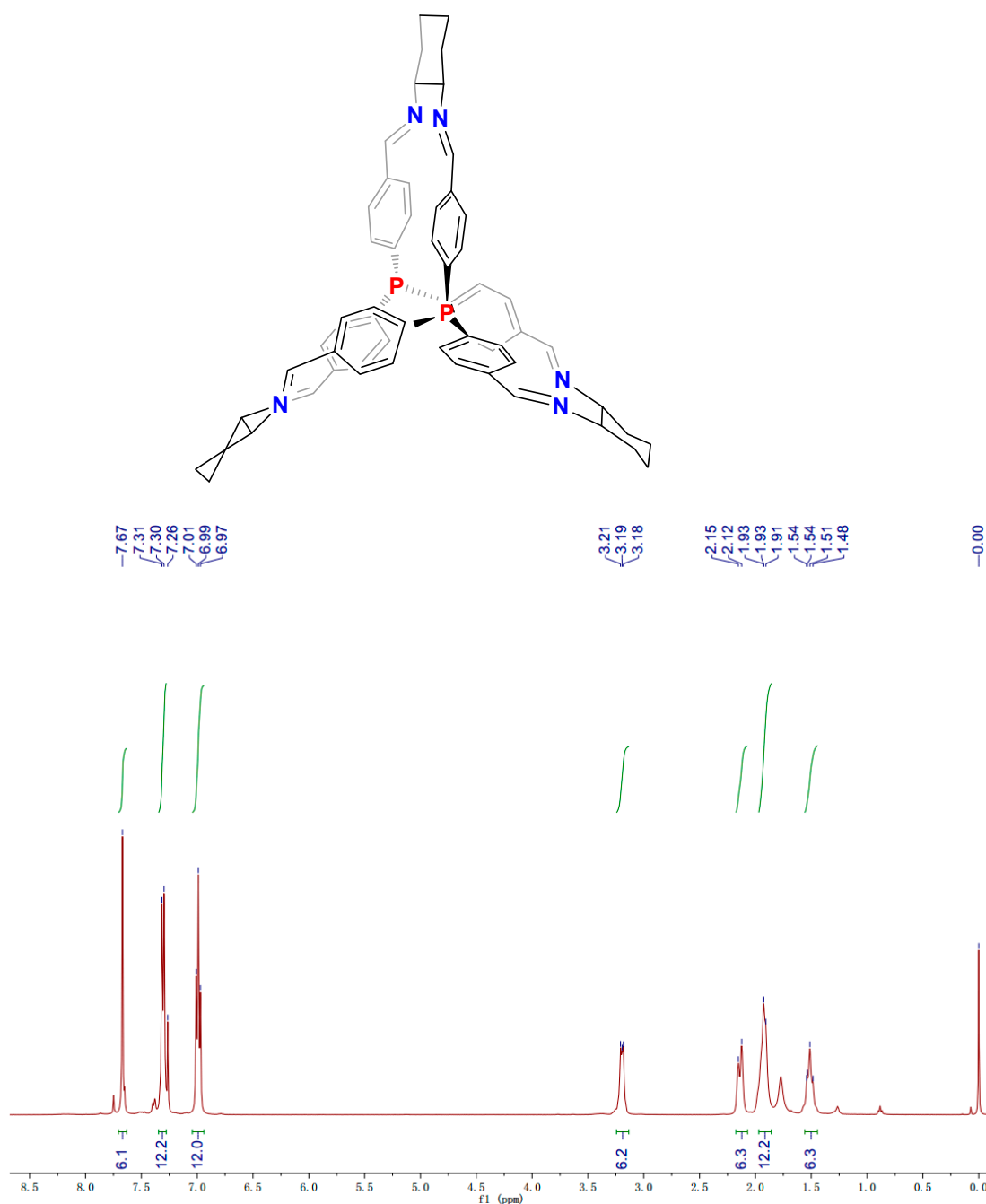
# Supplementary Materials: The Ionic Organic Cage: An Effective and Recyclable Testbed for Catalytic CO<sub>2</sub> Transformation

Wenlong Wang <sup>1,\*</sup>, Yuanyou Mao <sup>1,2</sup>, Jutao Jin <sup>1</sup>, Yanping Huo <sup>2,\*</sup> and Lifeng Cui <sup>1,\*</sup>

<sup>1</sup> School of Materials Science and Engineering, Dongguan University of Technology, Dongguan 523808, China; maoyuanyou126@126.com (Y.M.); jinjt@dgut.edu.cn (J.J.)

<sup>2</sup> School of Chemical Engineering and Light Industry, Guangdong University of Technology, Guangzhou 510006, China

\* Correspondence: wangwl@dgut.edu.cn (W.W.); yphuo@gdut.edu.cn (Y.H.); lcui@dgut.edu.cn (L.C.)



**Figure S1.** <sup>1</sup>H NMR spectrum of cage 3.

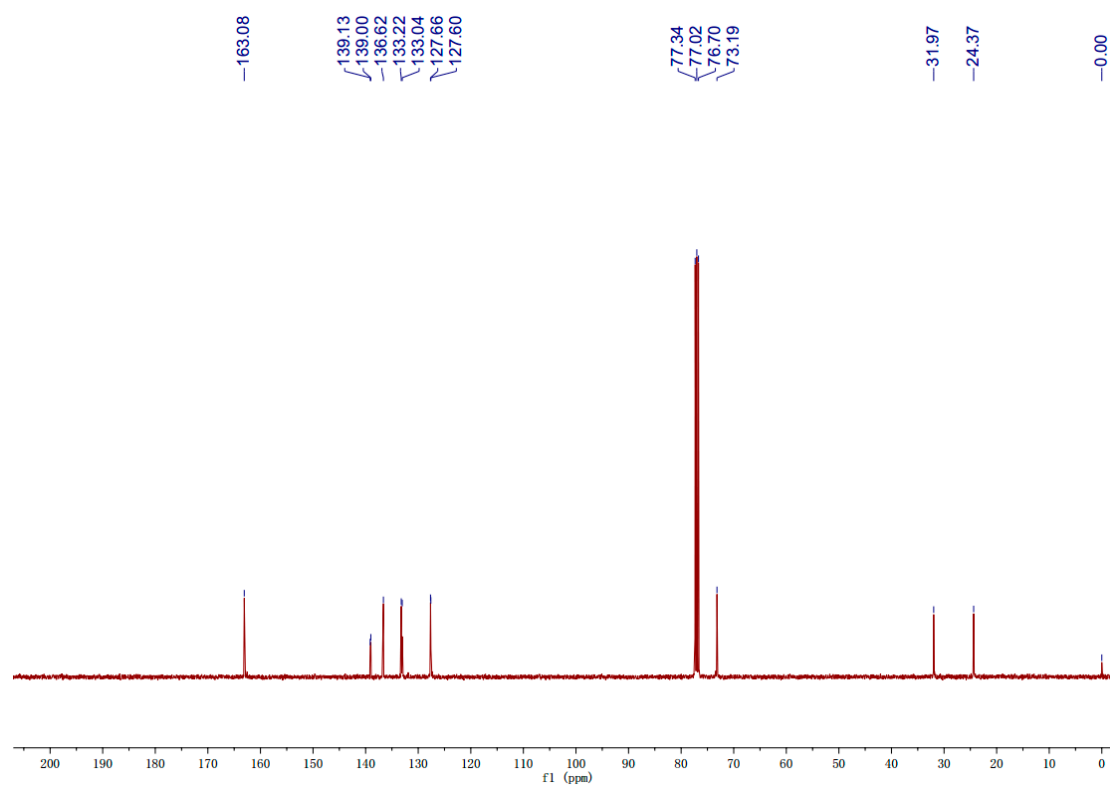


Figure S2.  $^{13}\text{C}$  NMR spectrum of cage 3.

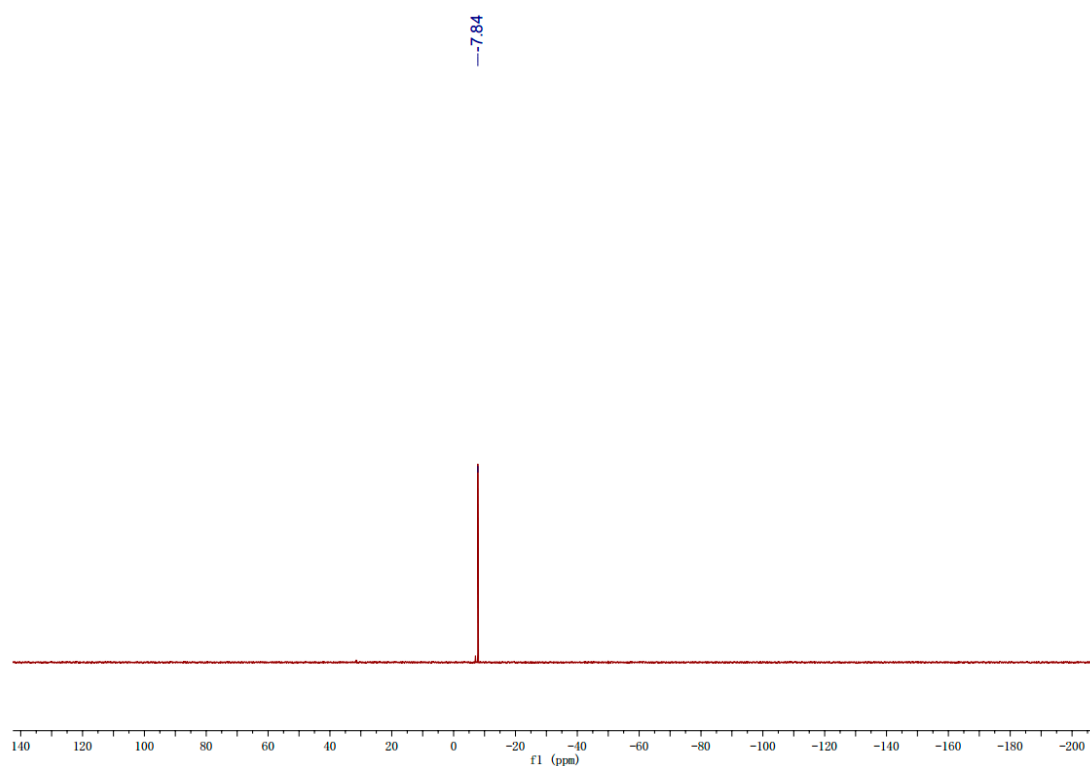


Figure S3.  $^{31}\text{P}$  NMR spectrum of cage 3.

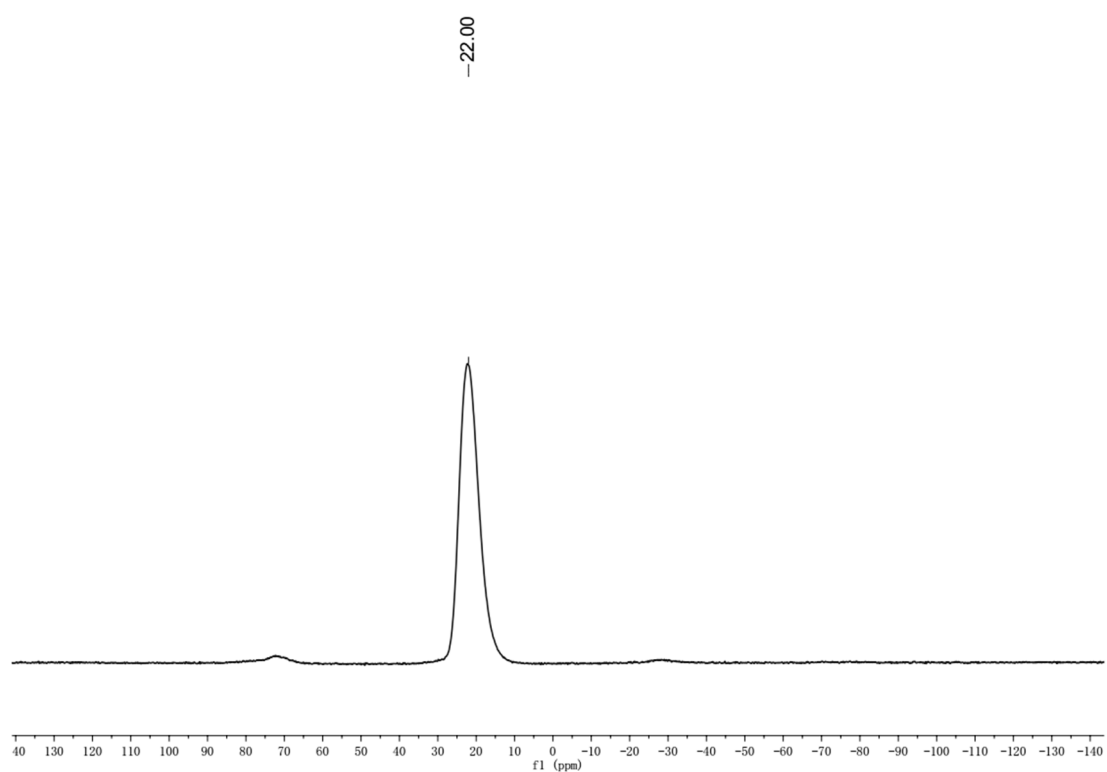


Figure S4. Solid-state  $^{31}\text{P}$  NMR spectrum of cage Iq-POC.

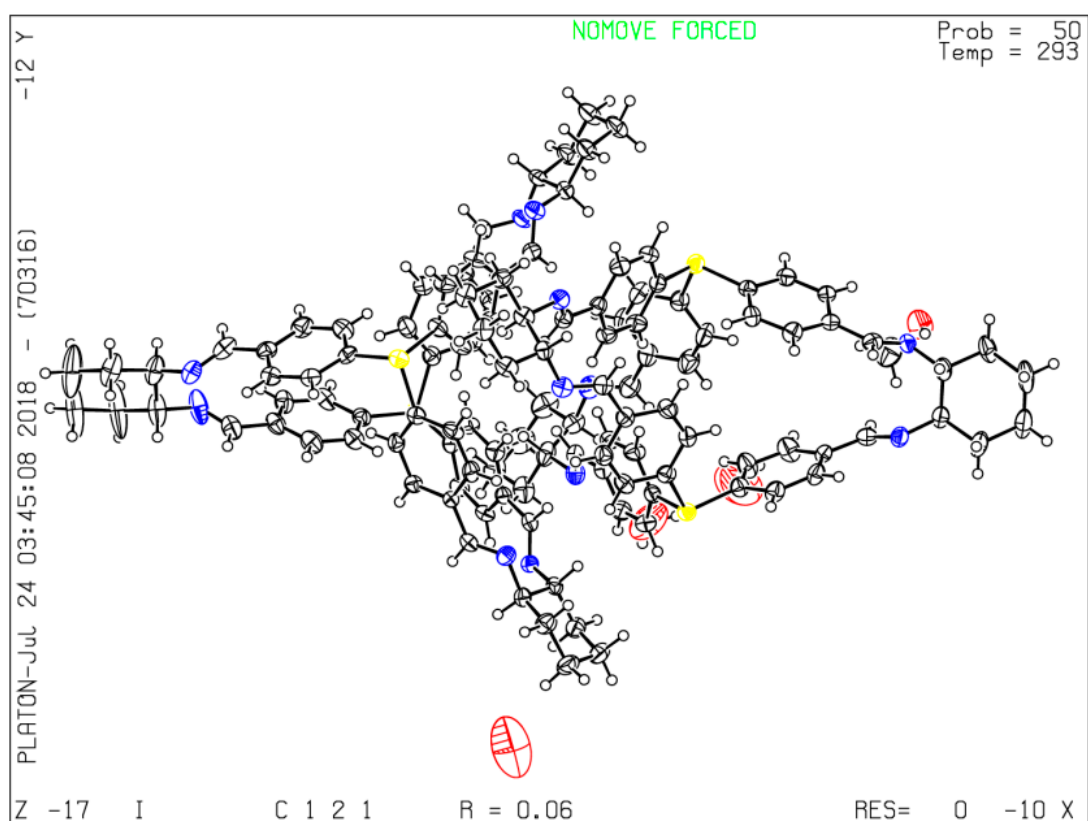


Figure S5. Monoclinic space group  $C2$  of cage 3.

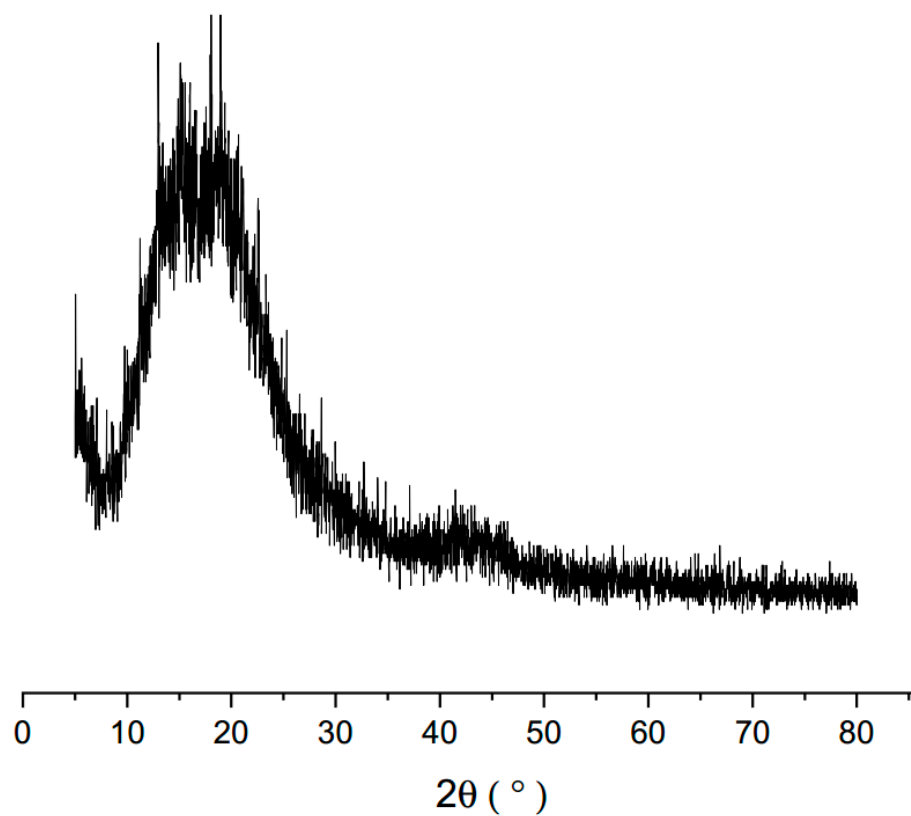


Figure S6. The PXRD spectrum of Iq-POC.

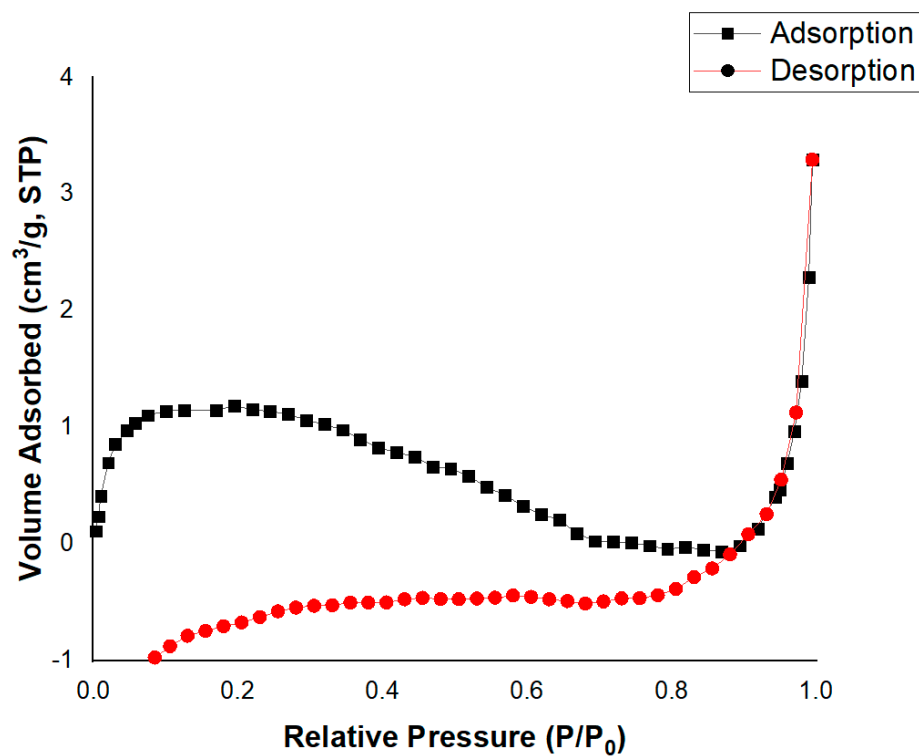


Figure S7.  $N_2$  sorption isotherms of Iq-POC measured at 77 K.

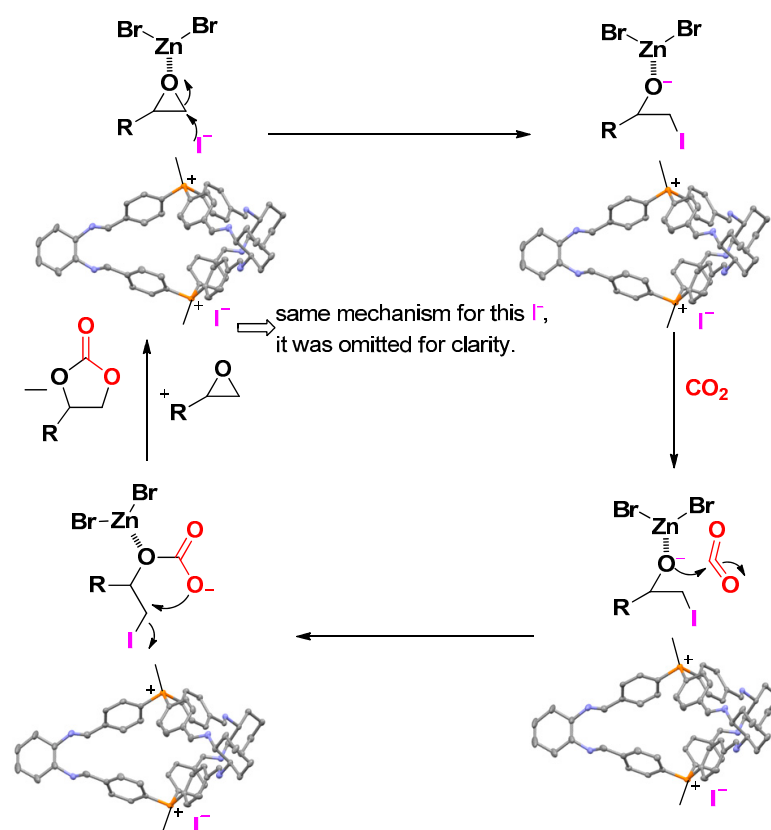
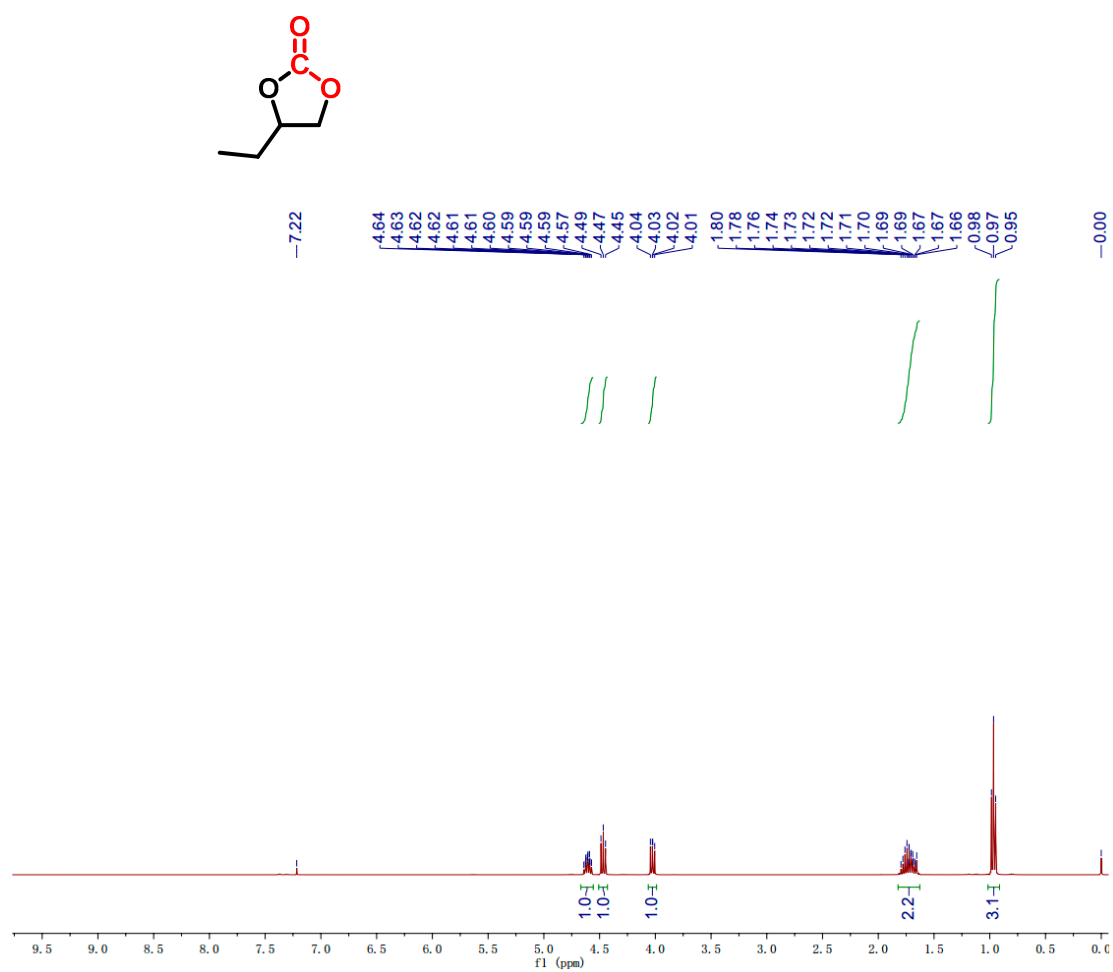
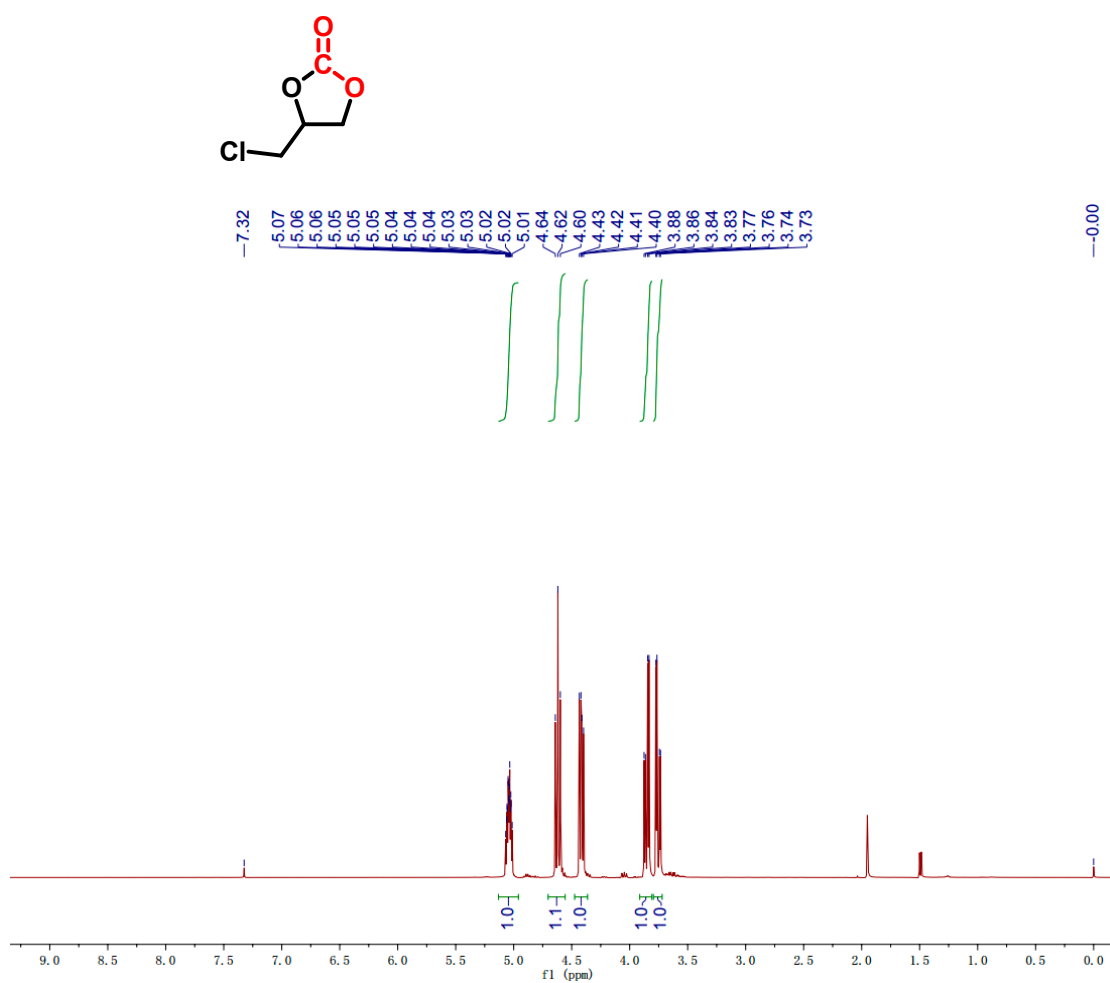
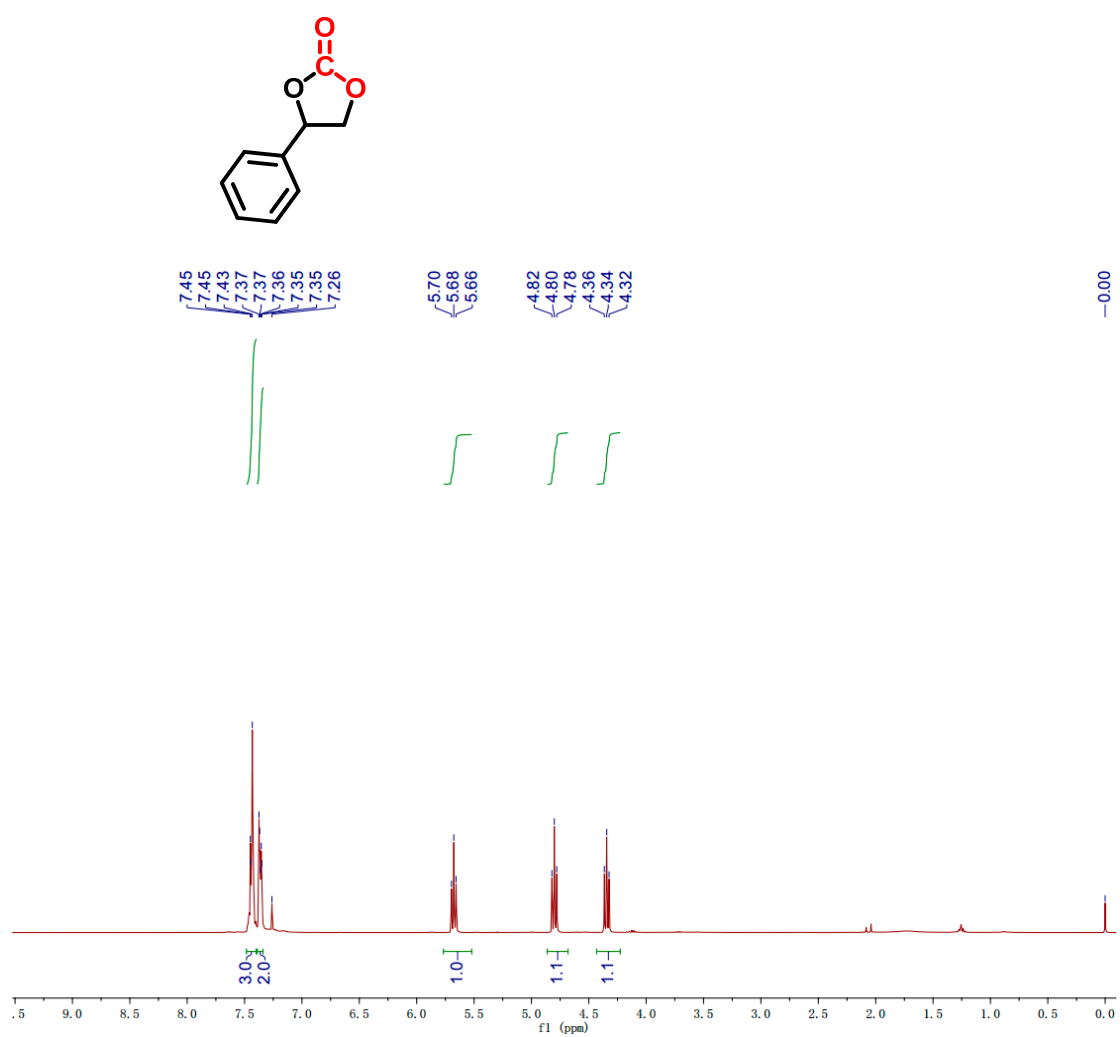


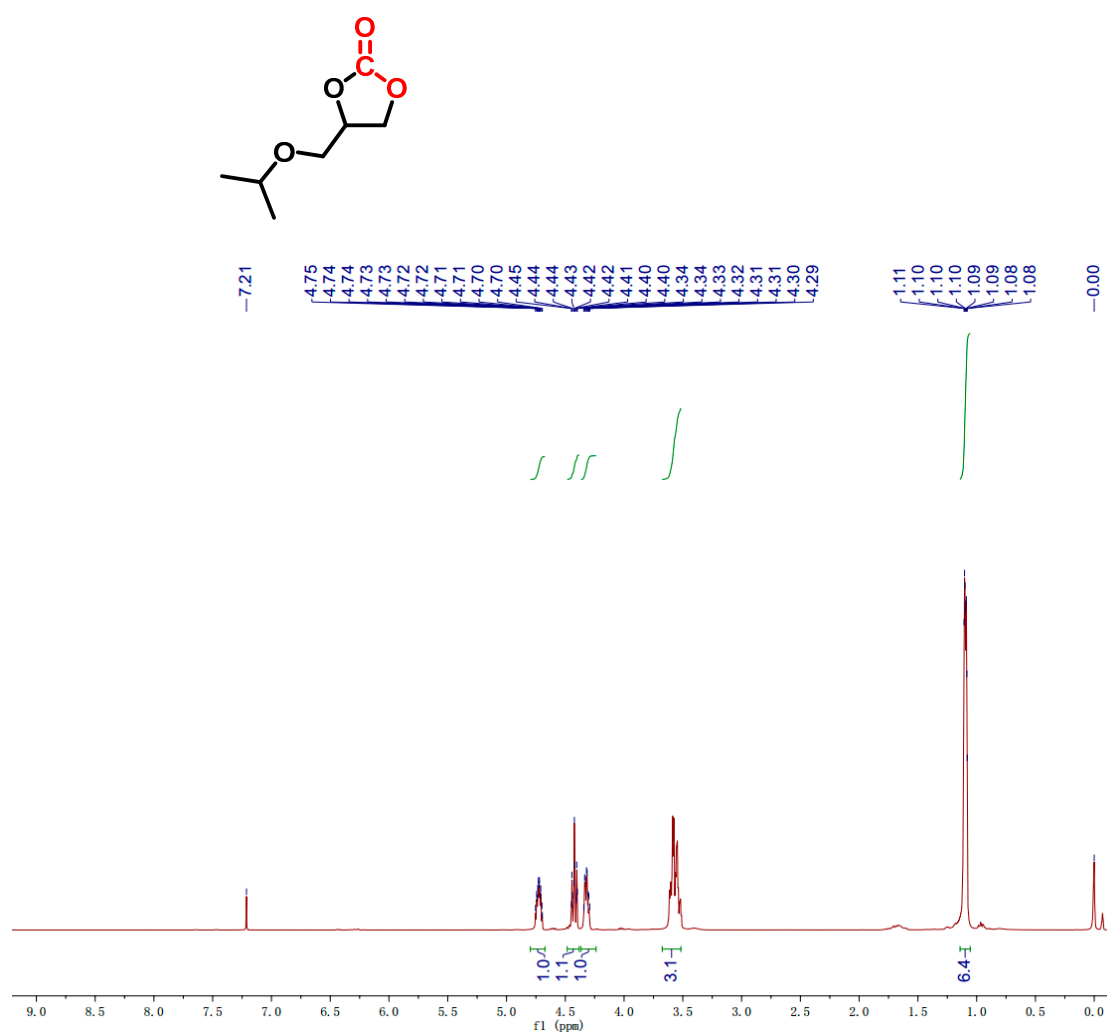
Figure S8. Proposed catalytic mechanism.

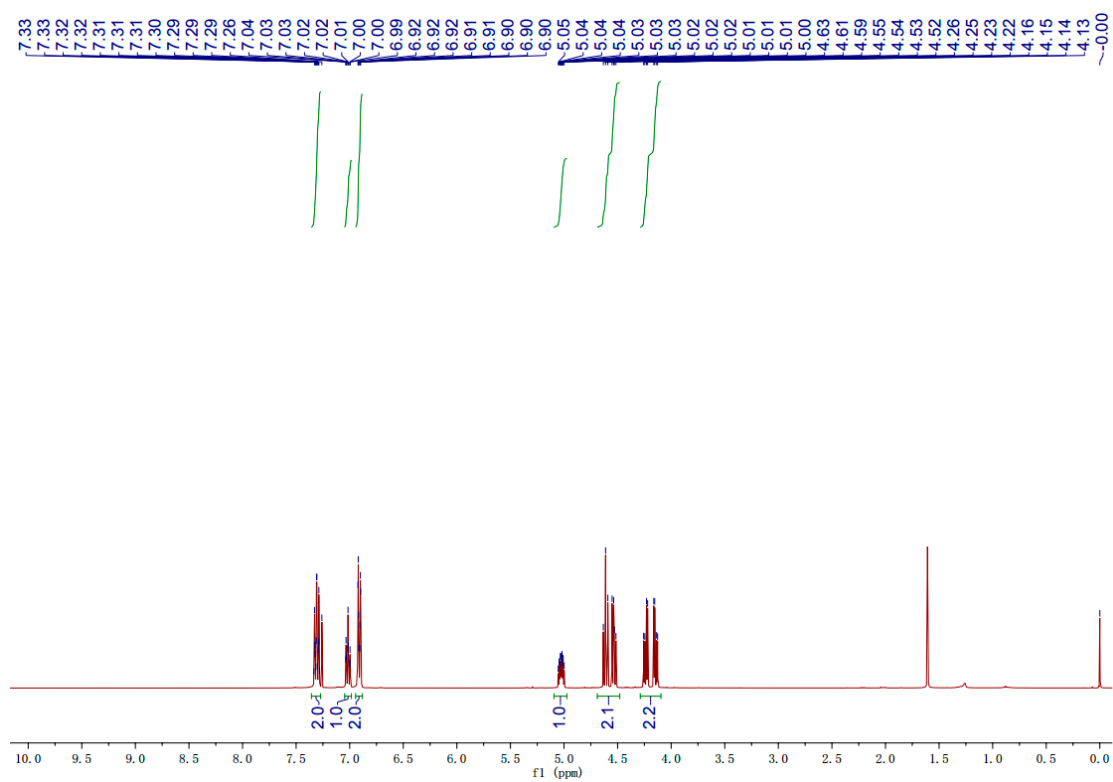
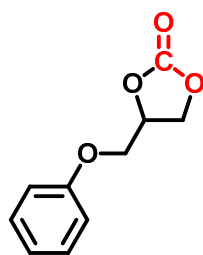












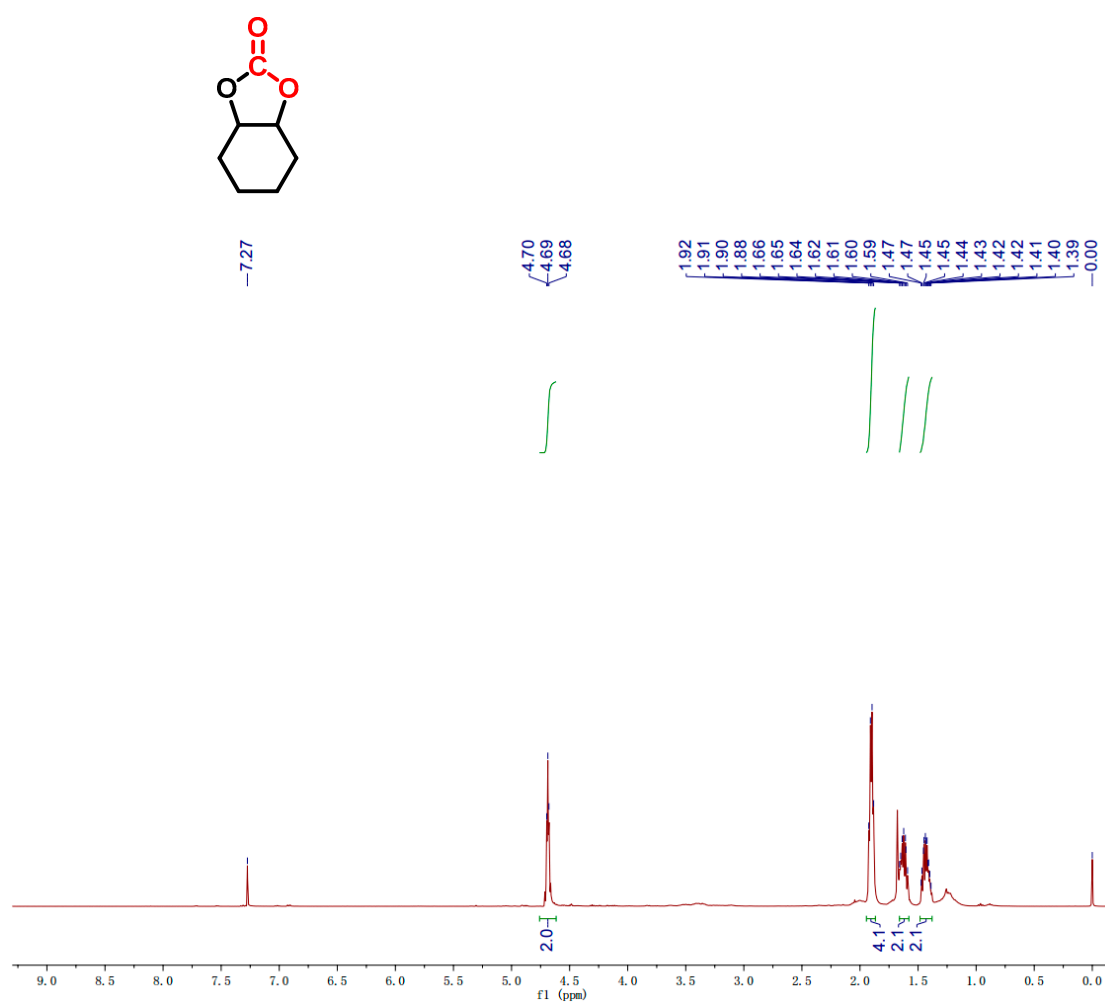


Figure S9. <sup>1</sup>H NMR copies of known products.