

# **Supplementary Materials**

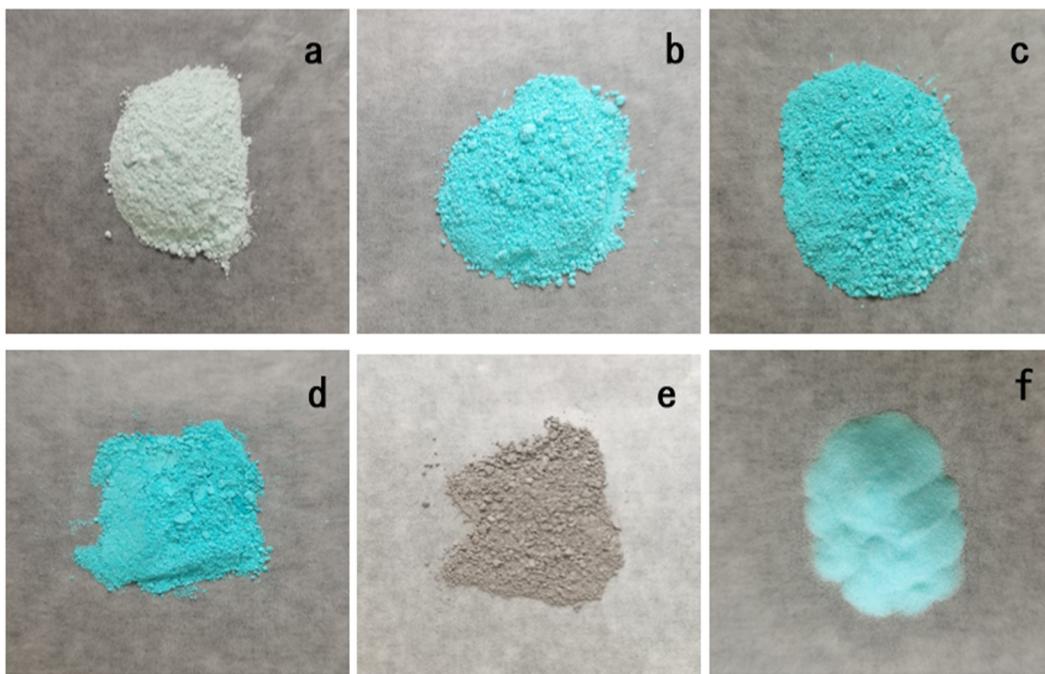
## **Highly Dispersed CuO/SiO<sub>2</sub> Catalysts Prepared via Ball-Milling Route: The Structural Evolution and the Catalytic Activities for Catalytic Combustion of Ethyl Acetate**

**Yuhang Ye<sup>1</sup>, Han Chen<sup>1</sup>, Yuchuan Ye<sup>1</sup>, Huiqiu Zhang<sup>1</sup>, Jing Xu<sup>1</sup>, Luhui Wang<sup>2</sup> and Liuye Mo<sup>1,\*</sup>**

<sup>1</sup> National Engineering Research Center for Marine Aquaculture, Zhejiang Ocean University, Zhoushan 316022, China; yeuhang2022@126.com (Y.Y.); ch31012@163.com (H.C.); yeuchuan@zjou.edu.cn (Y.Y.); zhanghuiqiu2006@163.com (H.Z.); jingxu@zjou.edu.cn (J.X.)

<sup>2</sup> School of Petroleum Chemical Engineering & Environment, Zhejiang Ocean University, Zhoushan 316022, China; wangluhui1008@zjou.edu.cn

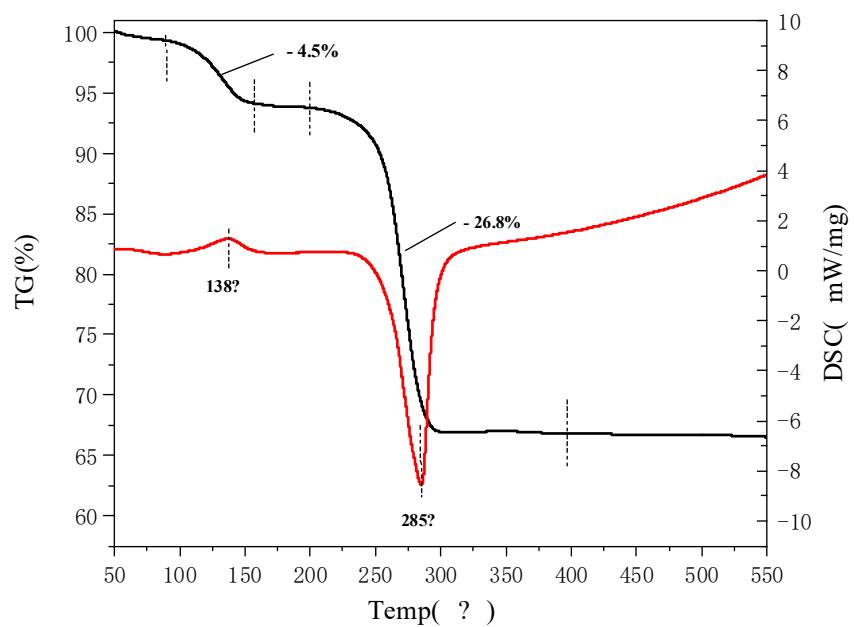
\* Correspondence: liuyemo@zjou.edu.cn



**Figure S1-A.** Image of all uncalcined catalysts (a: 5%Cu-A-BM, b: 10%Cu-A-BM, c: 15%Cu-A-BM, d: 20%Cu-A-BM, e: 10%Cu-O-BM, f: 10%Cu-N-IM)

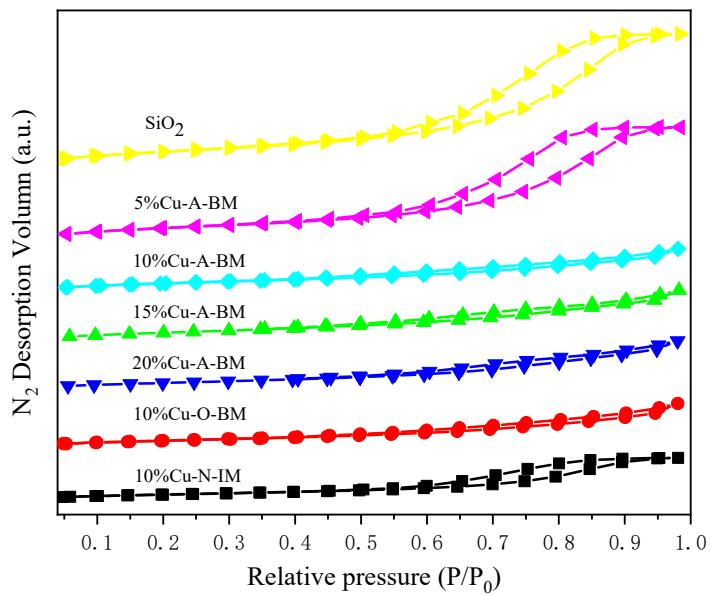


**Figure S1-B.** Image of all catalysts (a: 5%Cu-A-BM, b: 10%Cu-A-BM, c: 15%Cu-A-BM, d: 20%Cu-A-BM, e: 10%Cu-O-BM, f: 10%Cu-N-IM)

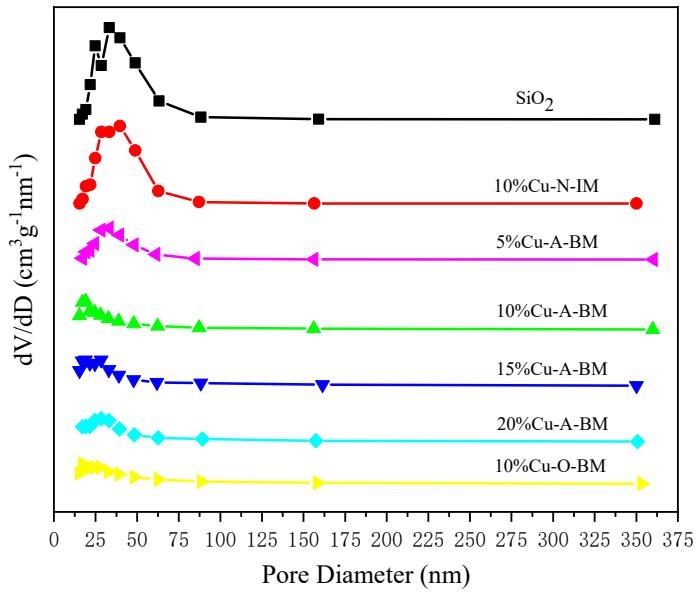


**Figure S2.** TG-DSC of the 20%Cu-A-MM sample.

Note: 20% Cu-A-MM was obtained by mechanical mixing by grinding appropriate amount of precursors (copper acetate and silica) in an agate mortar

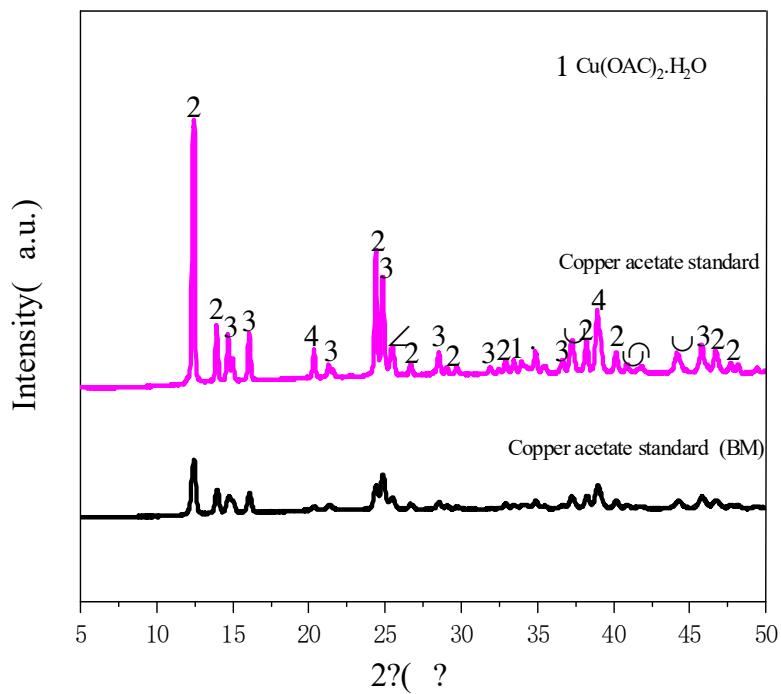


(A)

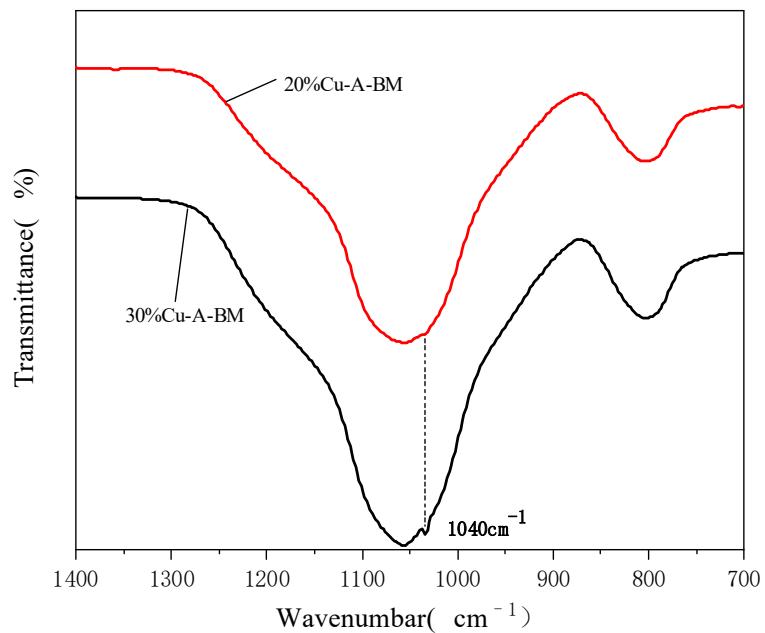


(B)

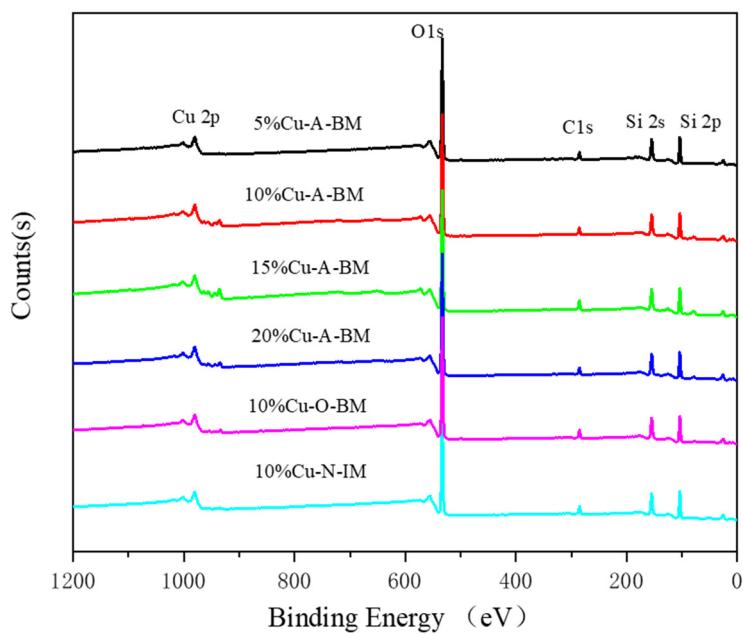
**Figure S3.**  $N_2$  adsorption isotherms curves (A) and pore size distribution (B).



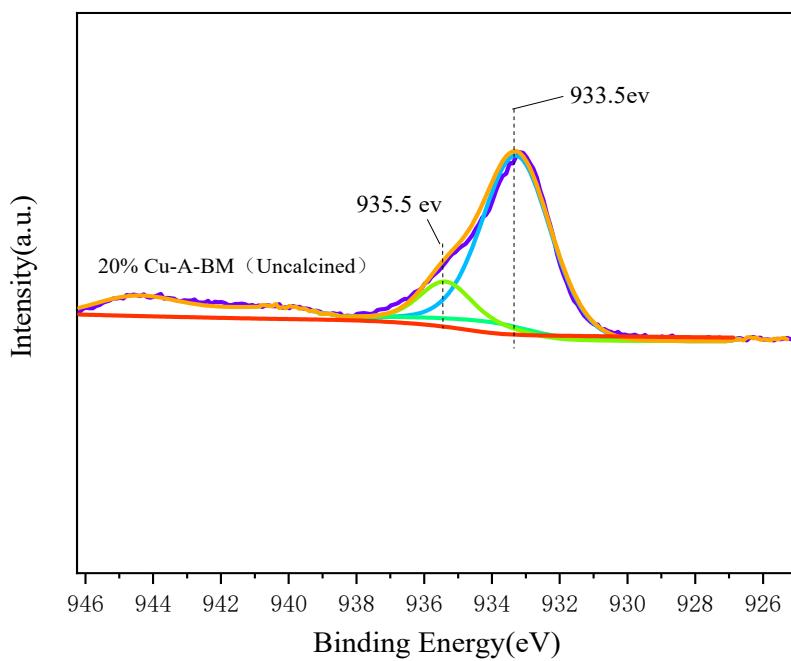
**Figure S4.** XRD comparison of copper acetate standard before and after BM.



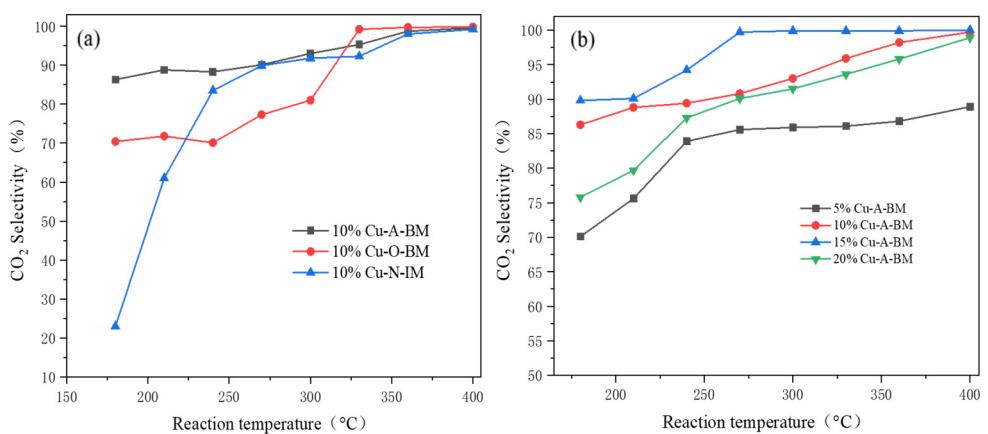
**Figure S5.** FT-IR spectra of the calcined samples of 30%Cu-A-BM and 20%Cu-A-BM (The two samples were calcined at  $500^\circ\text{C}$ ).



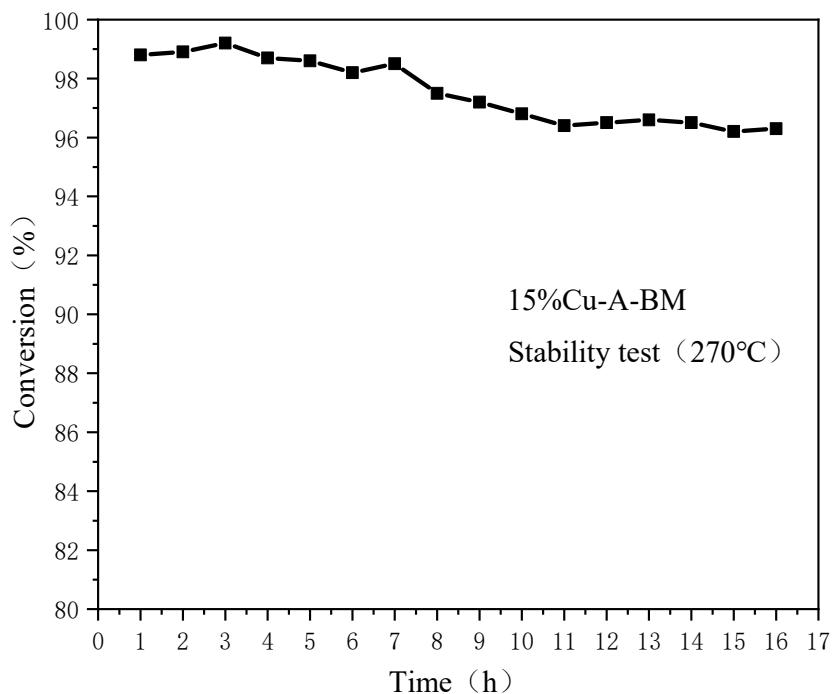
**Figure S6.** XPS surveys of all catalysts.



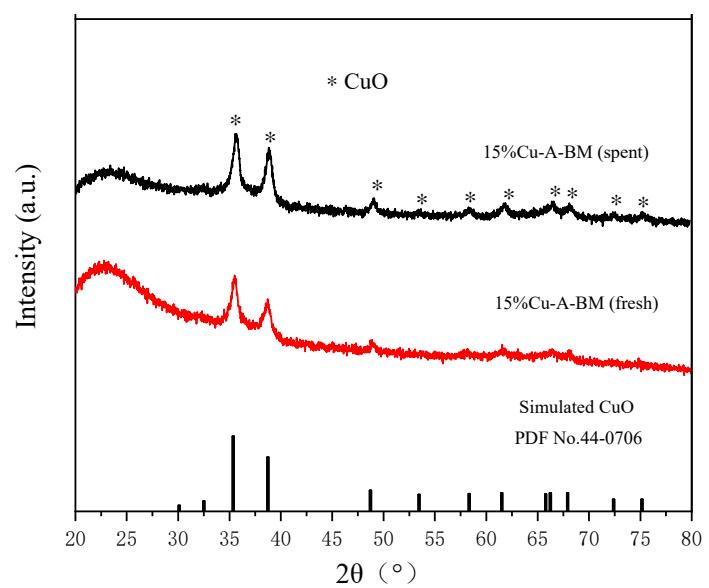
**Figure S7.** Cu<sup>2+</sup>p spectra of 20%Cu-A-BM (uncalcined)



**Figure S8.** (a,b) Selectivities of CO<sub>2</sub> over the CuO/SiO<sub>2</sub> catalysts.



**Figure S9.** Stability of the 15%Cu-A-BM catalyst at 270 °C.



**Figure S10.** XRD patterns of the spent and the fresh 15%Cu-A-BM catalysts.