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Supporting Information

New Journal of Chemistry

Hydrogenation of Dimethyl Malonate to 1,3-Propanediol Catalyzed by Cu/SiO_2 Catalyst: Reaction Network and Effect of Cu^+/ Cu^0 on Selectivity

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Table of contents

Fig. S1. XRD patterns of dried, calcined, and reduced $20Cu/SiO_2$ samples
Fig. S2. FTIR spectra of fresh, calcined, and reduced $20Cu/SiO_2$ samples
Fig. S3. Cu 2p XPS spectra of calcined and reduced $20Cu/SiO_2$ samples
Fig. S4. In situ FT-IR spectra of CO chemisorption on as-reduced catalysts.
Fig. S5. TEM images of different copper loading catalysts after calcination and reduction.
Fig. S6. Yield of 1,3-PDO and Cu^0 surface area calculated from N_2O titration against copper loadings
Fig. S7. Yield of 1,3-PDO against S_{Cu0}
Fig. S8 Selectivity of 1,3-PDO against S_{Cu0}

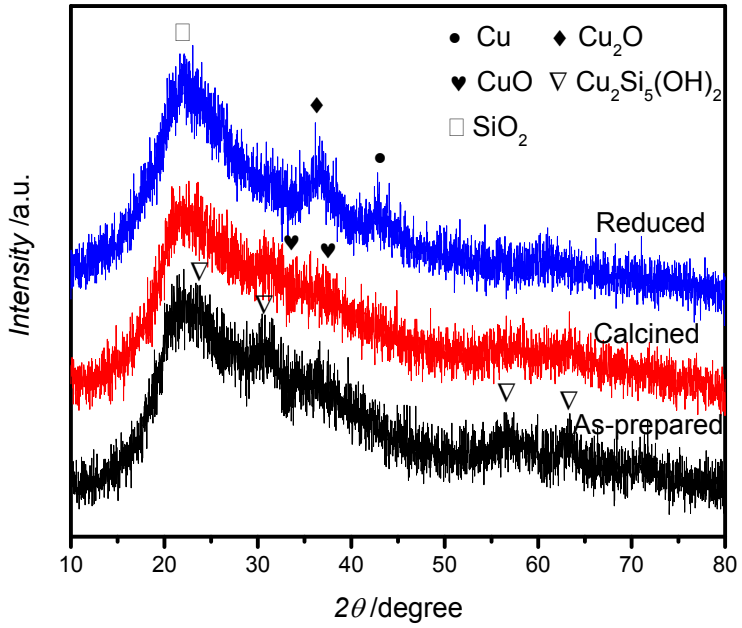

Fig. S1. XRD patterns of dried, calcined, and reduced 20Cu/SiO_2 samples.

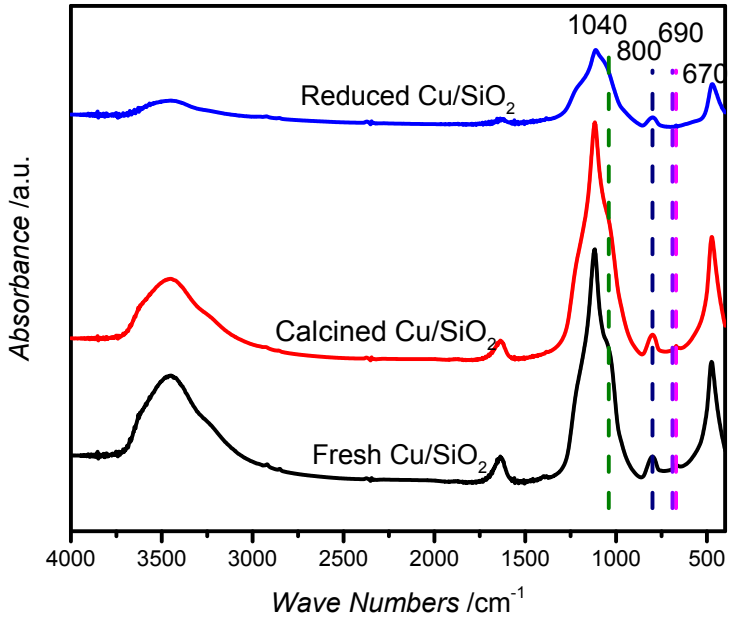

Fig. S2. FTIR spectra of fresh, calcined, and reduced 20Cu/SiO_2 samples.

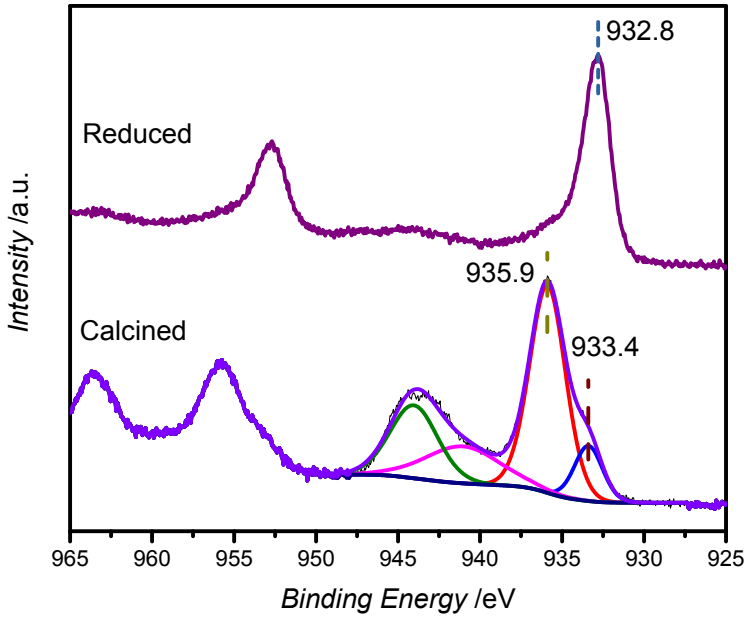

Fig. S3. Cu 2p XPS spectra of calcined and reduced 20Cu/SiO_2 samples.

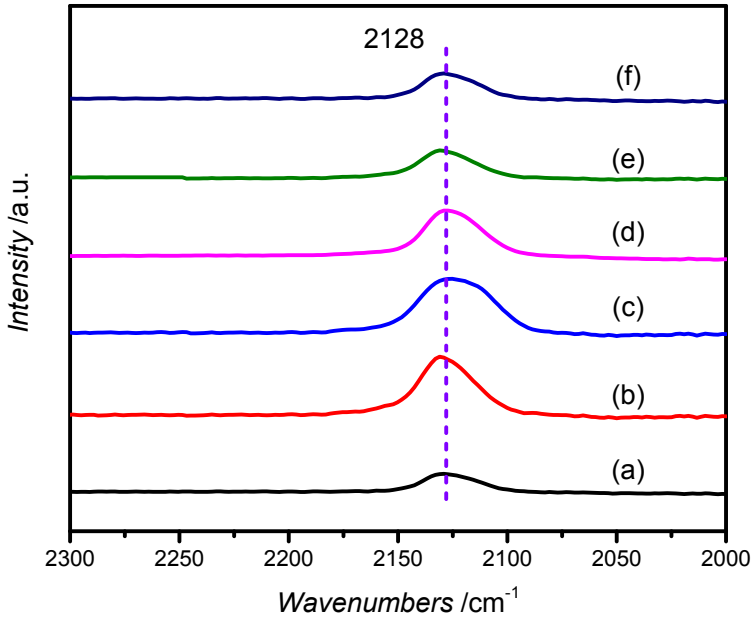

Fig. S4. In situ FT-IR spectra of CO chemisorption on as-reduced catalysts.
(a) 10Cu/SiO_2, (b) 15Cu/SiO_2, (c) 20Cu/SiO_2, (d) 25Cu/SiO_2, (e) 30Cu/SiO_2, (f) 40Cu/SiO_2,

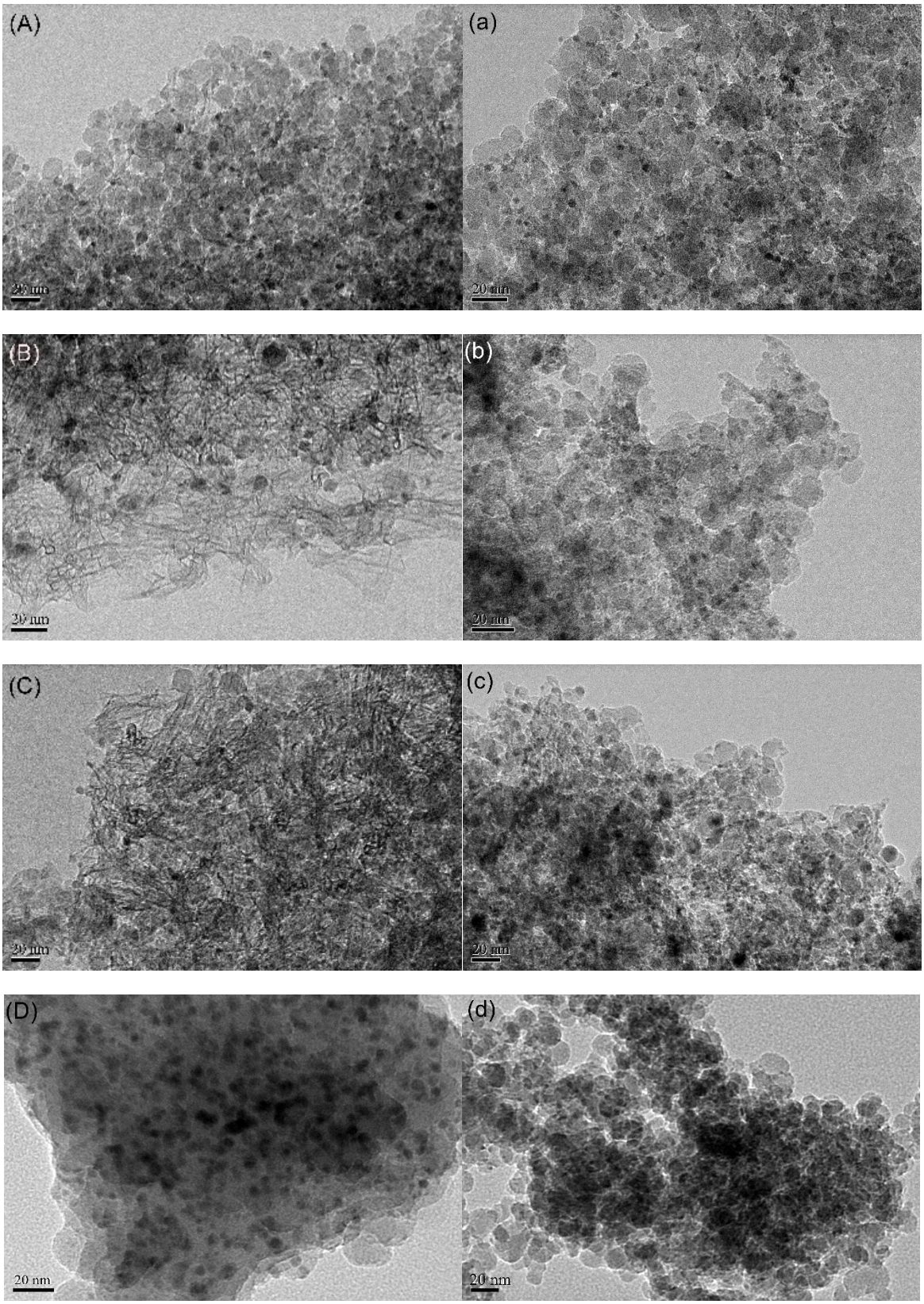

Fig. S5. TEM images of different copper loading catalysts after calcination and reduction.

(A) 10Cu/SiO_2-*c*; (B) 20Cu/SiO_2-*c*; (C) 30Cu/SiO_2-*c*; (D) 20Cu/SiO_2-IM-*c*; (a) 10Cu/SiO_2-*r*; (b) 20Cu/SiO_2-*r*; (c) 30Cu/SiO_2-*r;* (d) 20Cu/SiO_2-IM-*r*.

c: after calcination, *r*: after reduction.

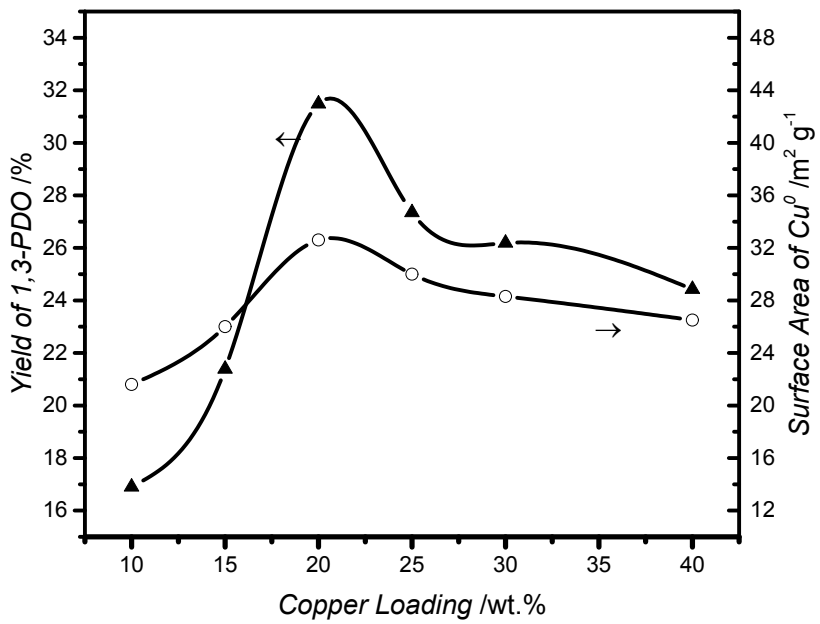

Fig. S6. Yield of 1,3-PDO and Cu^0 surface area calculated from N_2O titration against copper loadings.

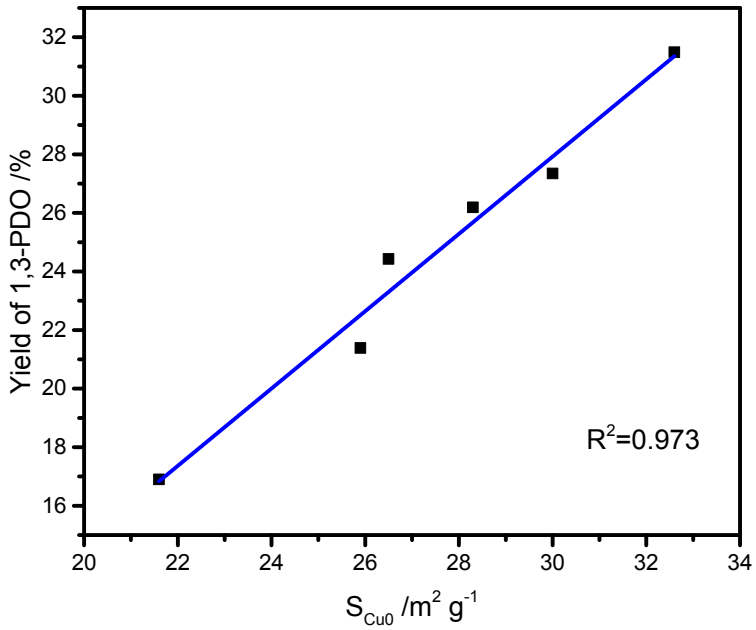

Fig. S7. Yield of 1,3-PDO against S_{Cu0}.

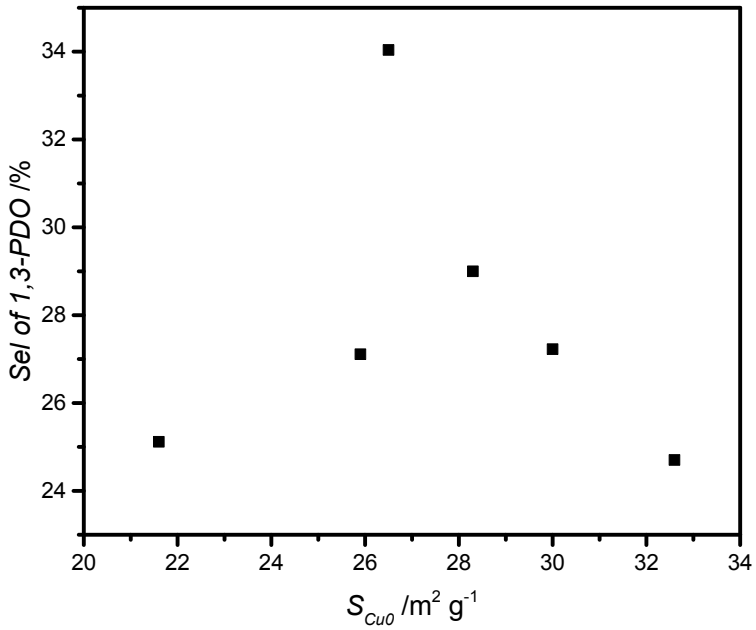

Fig. S8 Selectivity of 1,3-PDO against S_{Cu0}.