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1. H₂-TPR profiles: (a) Cu-MOR₁; (b) Cu-MOR₁-water (SiO₂/Al₂O₃ = 15.5).

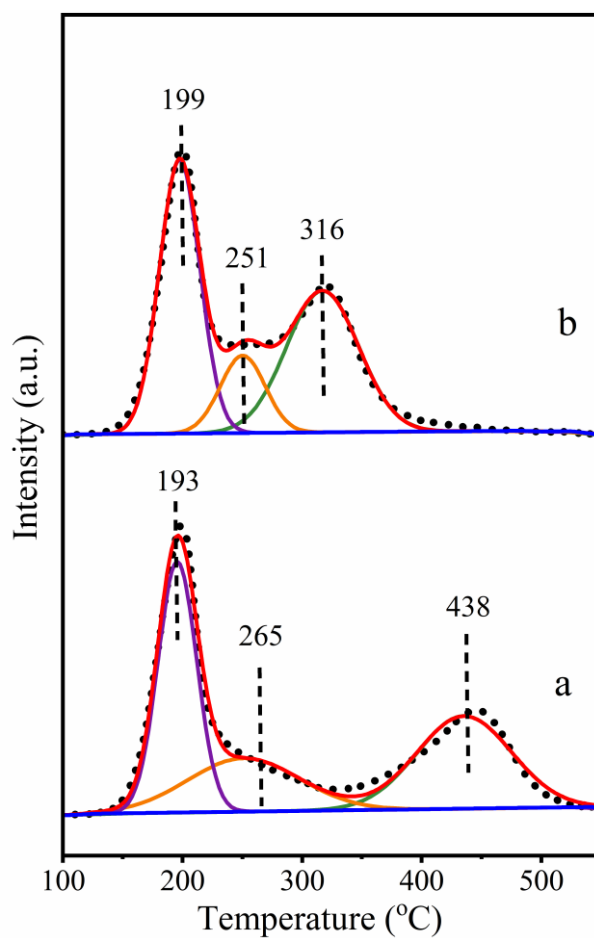


Figure S1. H₂-TPR profiles: (a) Cu-MOR₁; (b) Cu-MOR₁-water.

2. TEM images: (a) Cu-MOR₁; (b) Cu-MOR₁-water (SiO₂/Al₂O₃ = 15.5).

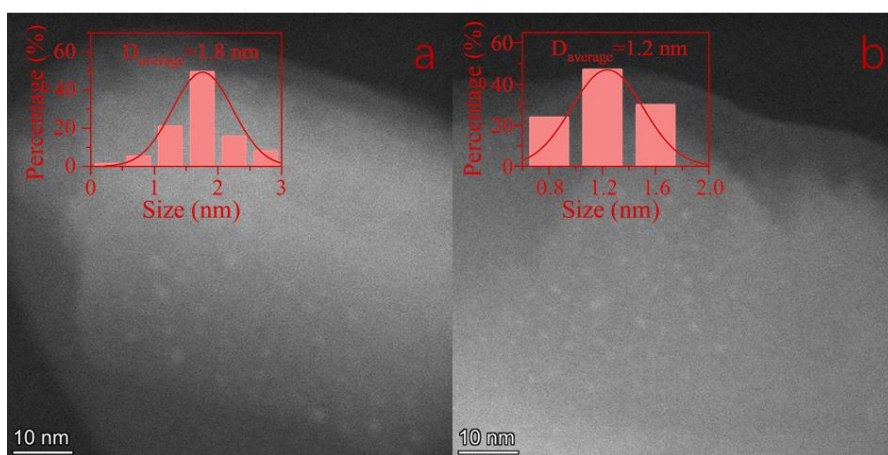


Figure S2. TEM images: (a) Cu-MOR₁; (b) Cu-MOR₁-water.

3. XPS spectra of Cu-MOR₂ and Cu-MOR₂-water (SiO₂/Al₂O₃ = 8.73).

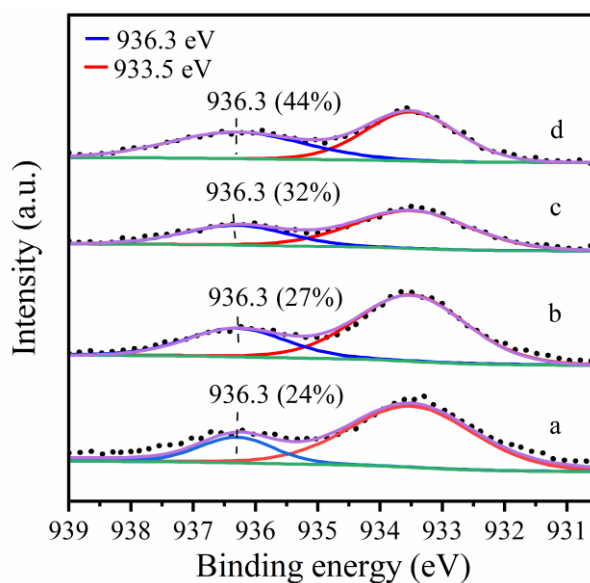


Figure S3. Cu₂p_{3/2} photoelectron spectra of (a) Cu-MOR₂, (b) Cu-MOR₂-water, (c) Cu-MOR₂ after calcined at 450 °C for 2 h, and (d) Cu-MOR₂-water after calcined at 450 °C for 2 h.

4. In-situ FTIR spectra :(a) Cu-MOR₂; (b) Cu-MOR₂-water (SiO₂/Al₂O₃ = 8.73).

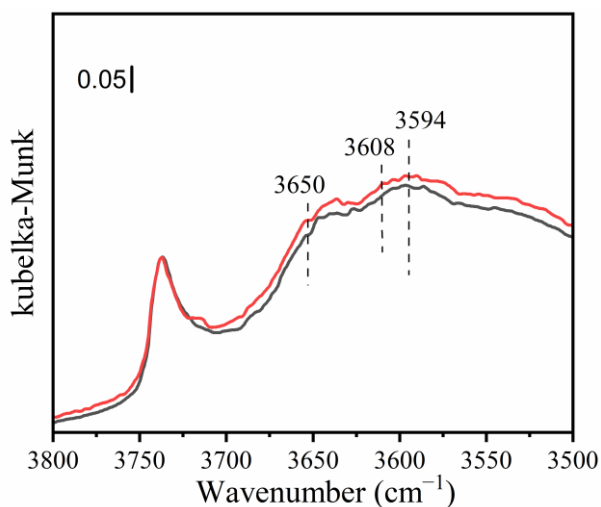


Figure S4. *In-situ* diffuse reflectance FTIR spectra: (a) Cu-MOR₂ after calcination at 450 °C; (b) Cu-MOR₂-water after calcination at 450 °C.

5. In-situ pyridine-IR spectra :(a) Cu-MOR₁; (b) Cu-MOR₁-water (SiO₂/Al₂O₃ = 15.5).

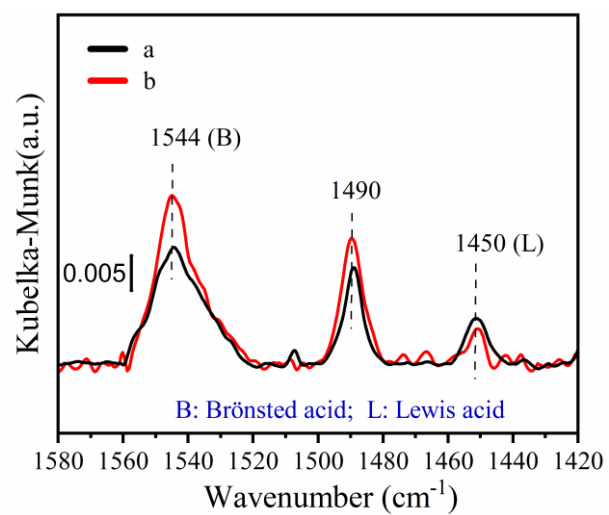


Figure S5. *In-situ* pyridine-IR spectra :(a) Cu-MOR₁; (b) Cu-MOR₁-water.