

Supplementary

Cu-THQ-EFG Composite for Highly Selective Electrochemical CO₂ Reduction to Formate at Low Overpotentials

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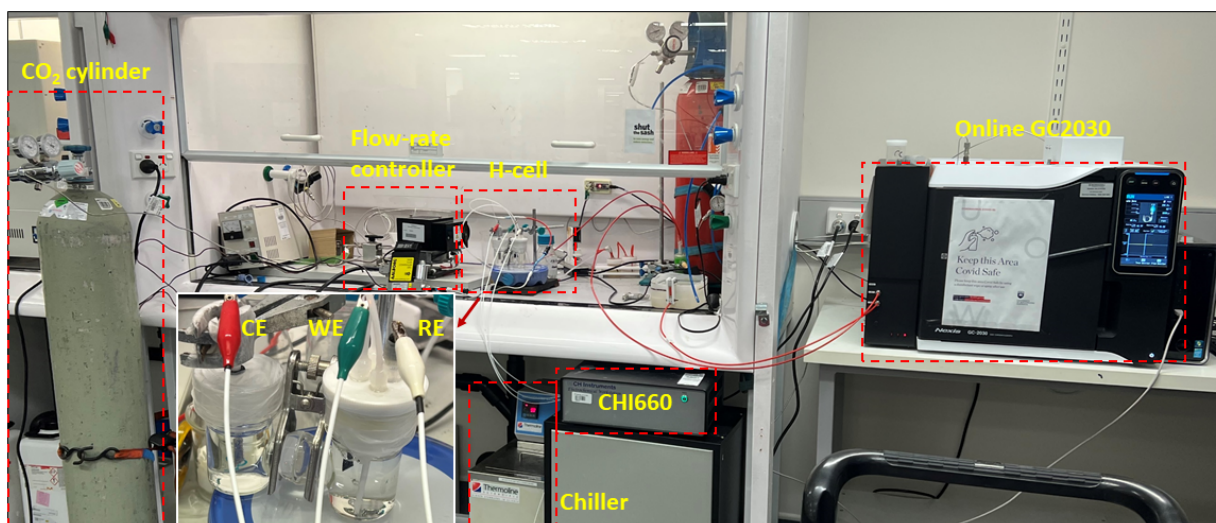


Figure S1. Digital image of the on-line gas analysis system employed for CO₂ electrocatalysis; insert is an enlarged image of the H-cell with two compartment.

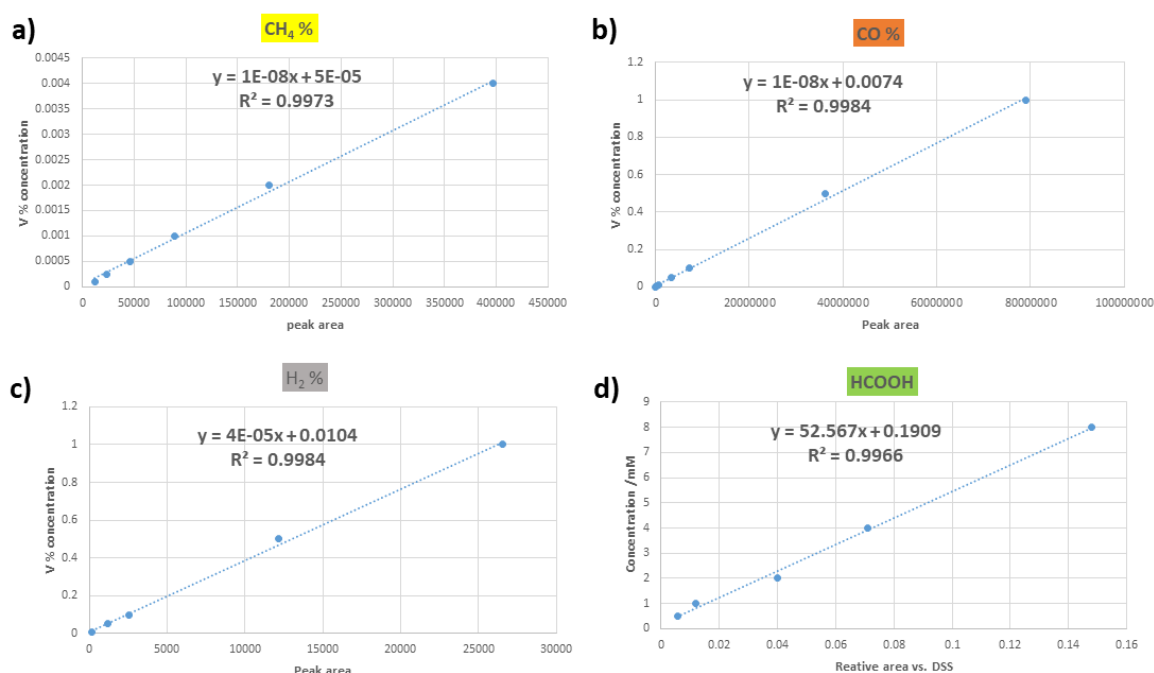


Figure S2. Calibration curve of gas product, a) CH₄, b) CO and c) H₂ and liquid product, d) HCOOH in electrocatalysis.

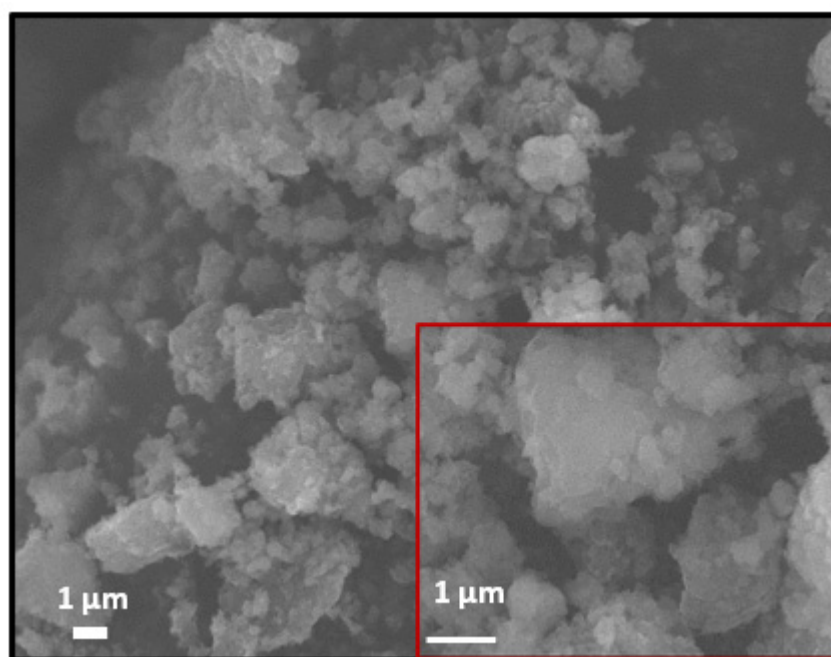


Figure S3. SEM images of Cu-THQ-GO composite.

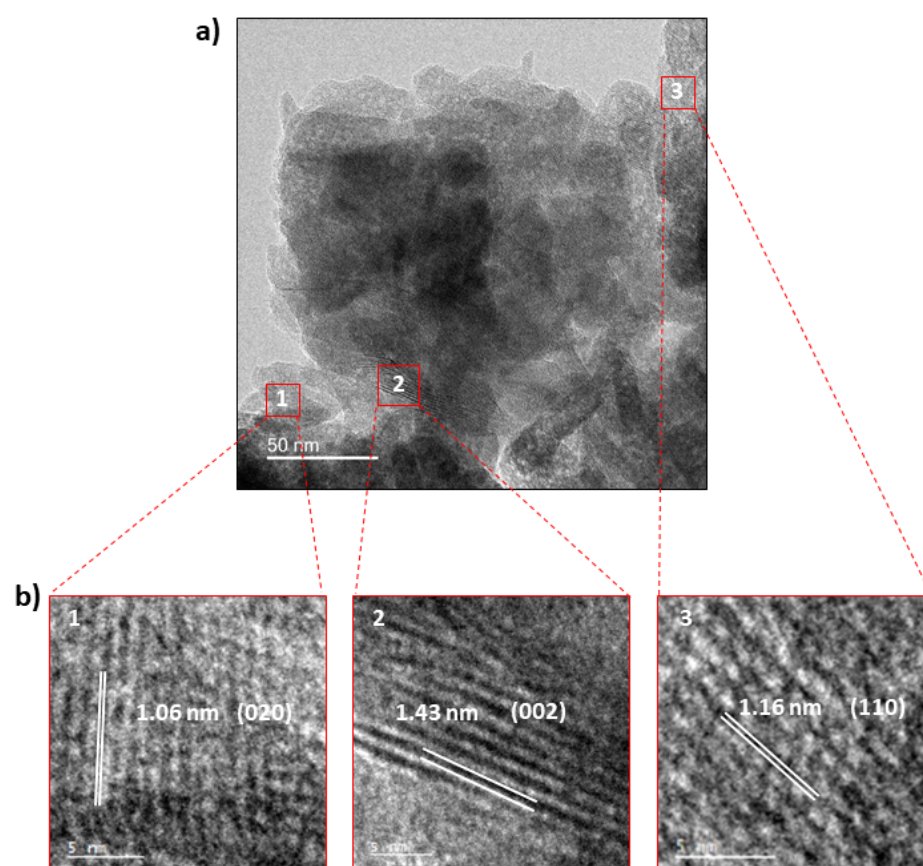


Figure S4. a) TEM image of Cu-THQ-EFG composite; b) enlarged TEM image of Cu-THQ phases in the composite.

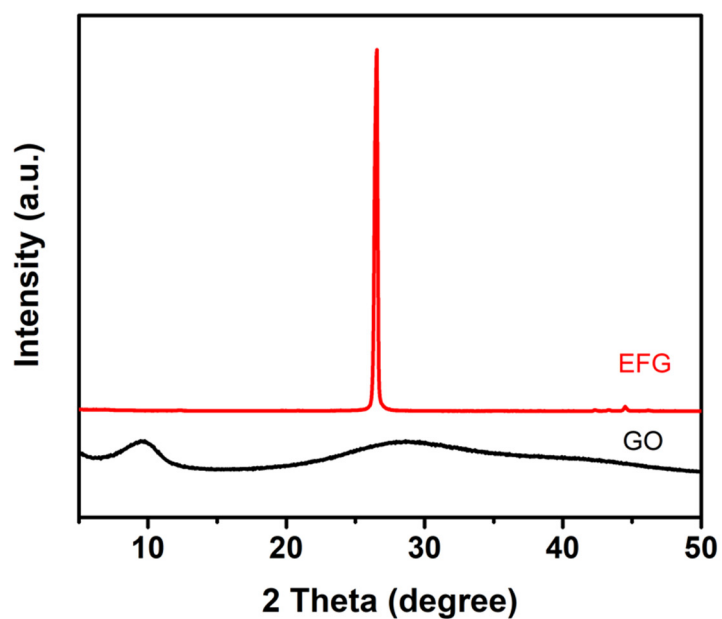


Figure S5. XRD curves of two substrate (GO and EFG).

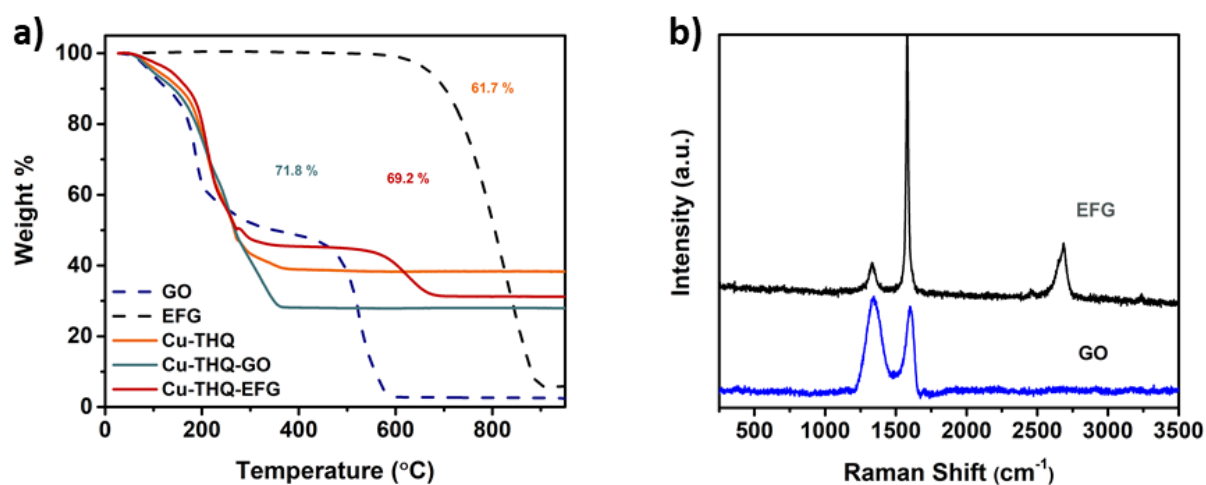


Figure S6. a) TGA curves of two substrate (GO and EFG) and three catalysts (Cu-THQ, Cu-THQ-GO and Cu-THQ-EFG), b) Raman spectrums of two substrate (GO and EFG).

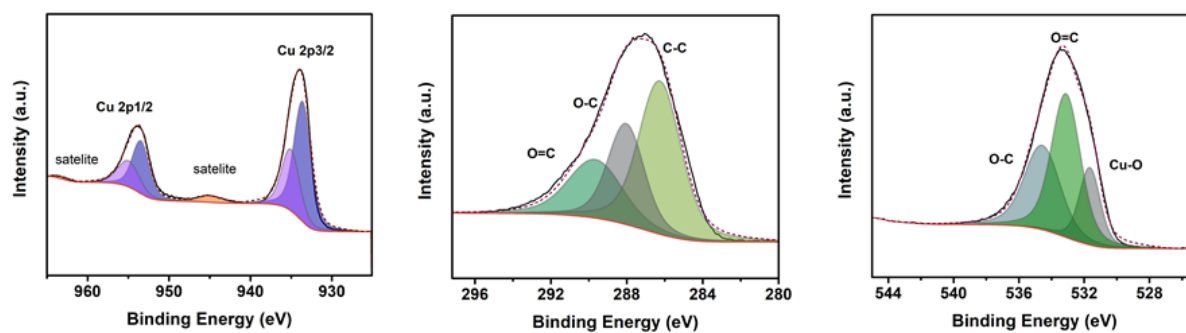


Figure S7. XPS of Cu-THQ.

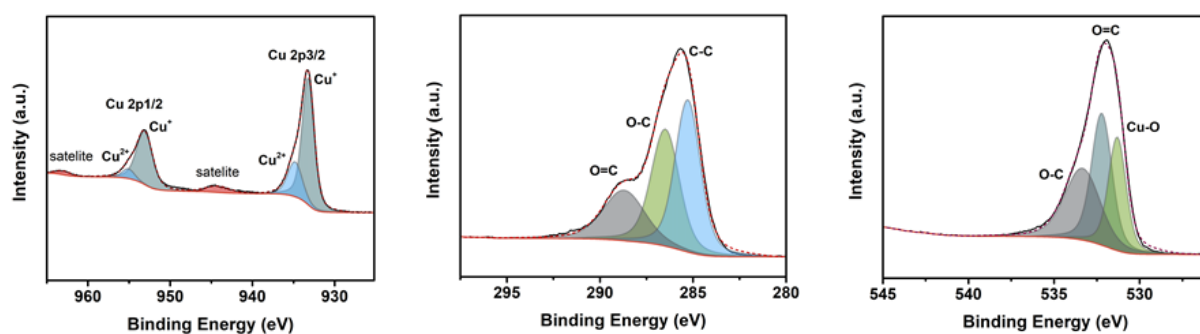
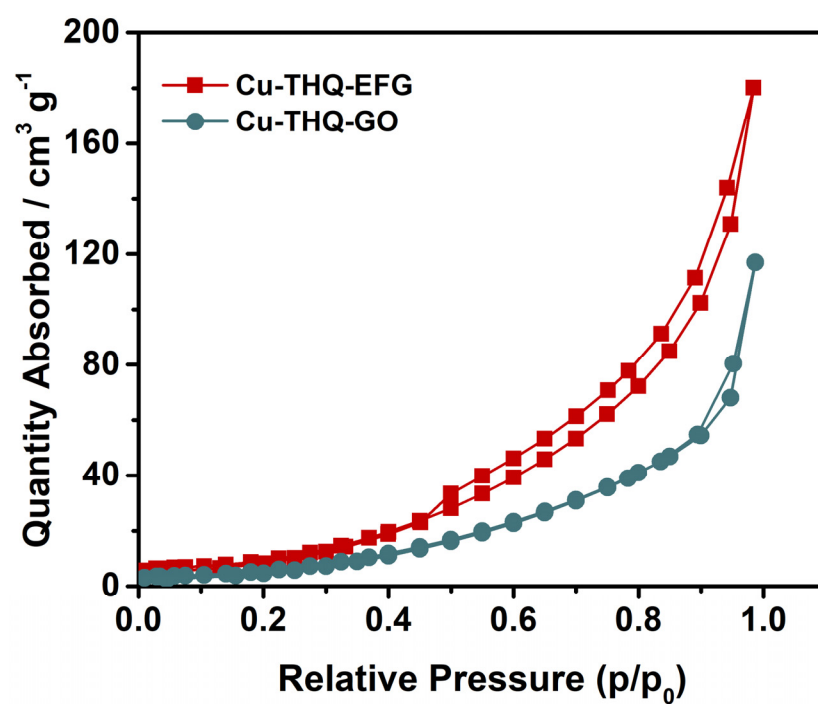


Figure S8. XPS of Cu-THQ-GO.

Figure S9. N₂ sorption isotherms of Cu-THQ-GO and Cu-THQ-EFG composite.

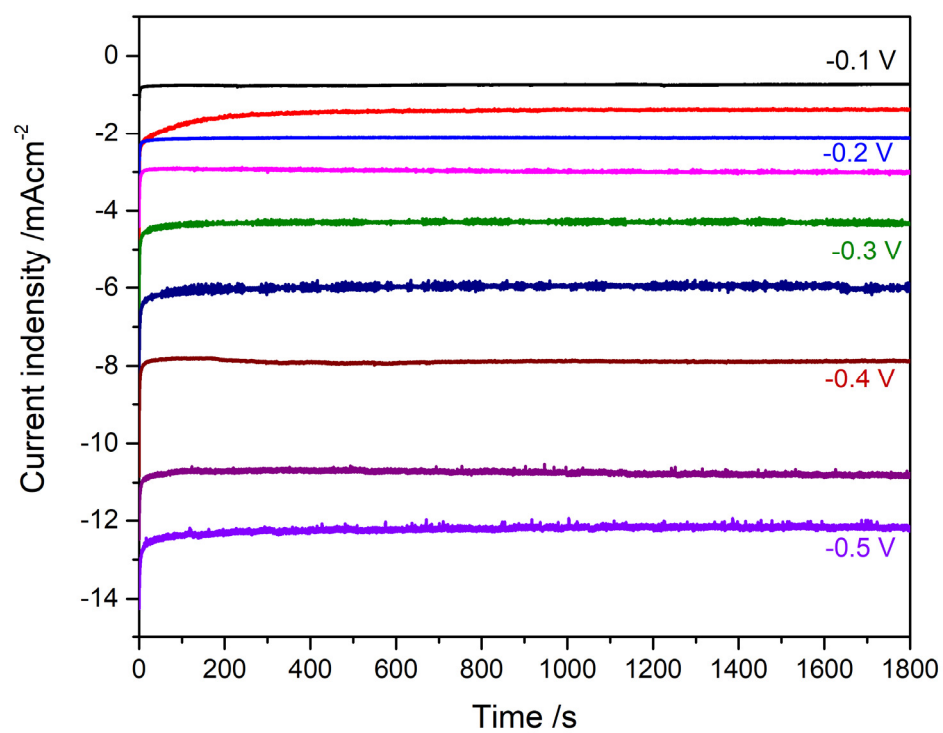
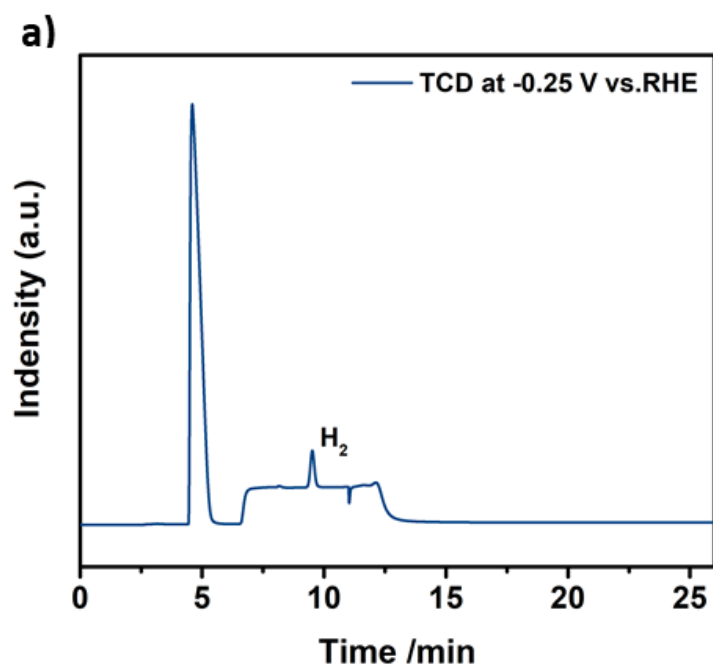


Figure S10. Controlled potential electrolysis (CPE) measurements at fixed potentials from -0.1 V to -0.5 V vs. RHE.



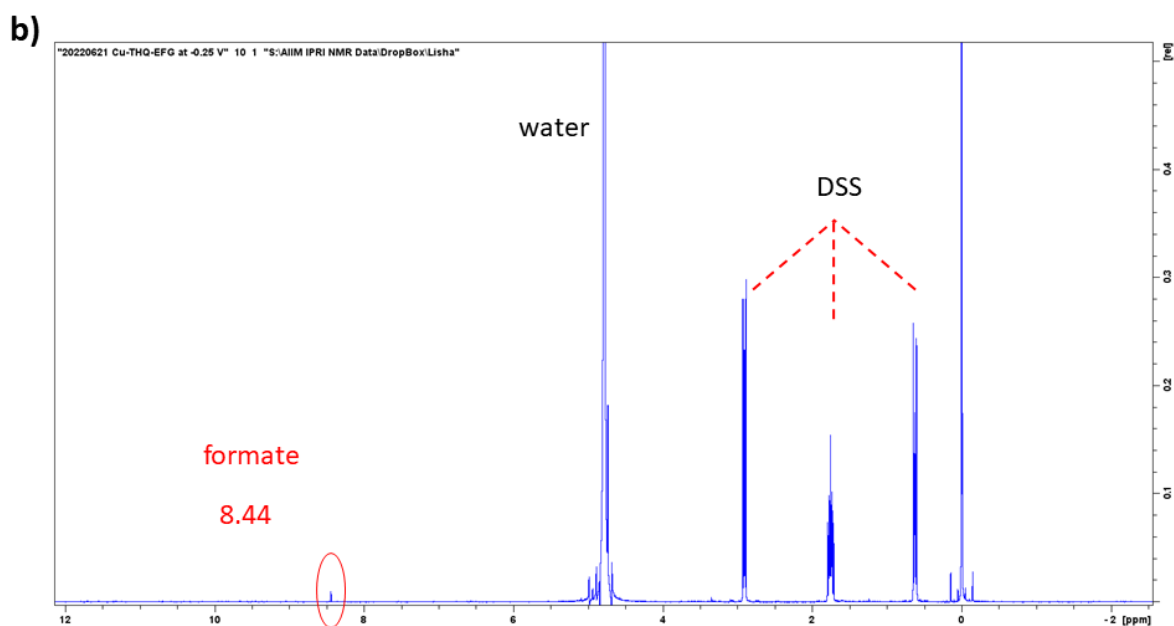


Figure S11. a) GC and b) NMR data of Cu-THQ-EFG at -0.25 V vs. RHE.

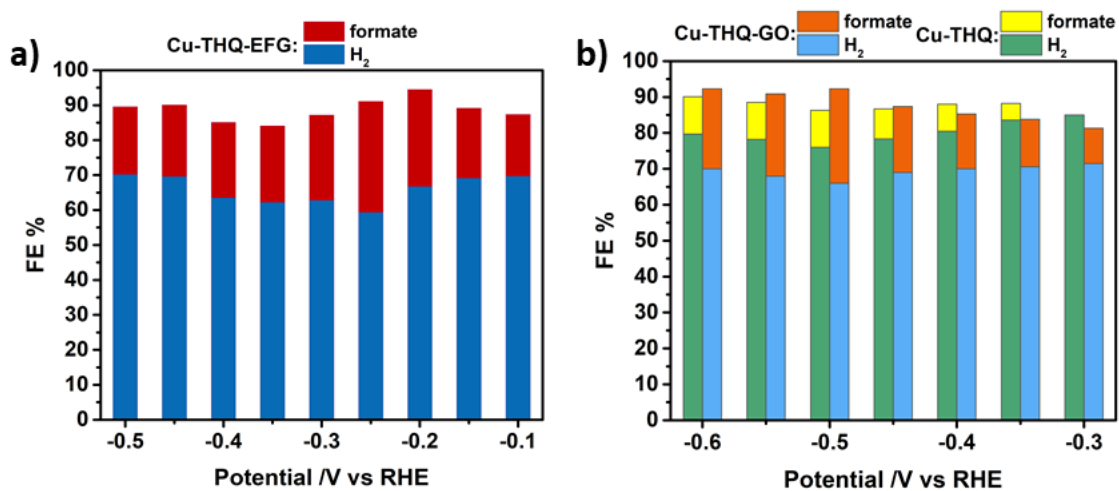


Figure S12. a) Faradaic efficiency of H₂ and formate for Cu-THQ-EFG at fixed potentials from -0.1 V to -0.5 V vs RHE; b) Faradaic efficiency of H₂ and formate for Cu-THQ and Cu-THQ-GO at fixed potentials from -0.3 V to -0.6 V vs. RHE.