

Electronic Supplementary Information

CO₂ emission free co-generation of energy and ethylene in hydrocarbon SOFC reactors with a dehydrogenation anode

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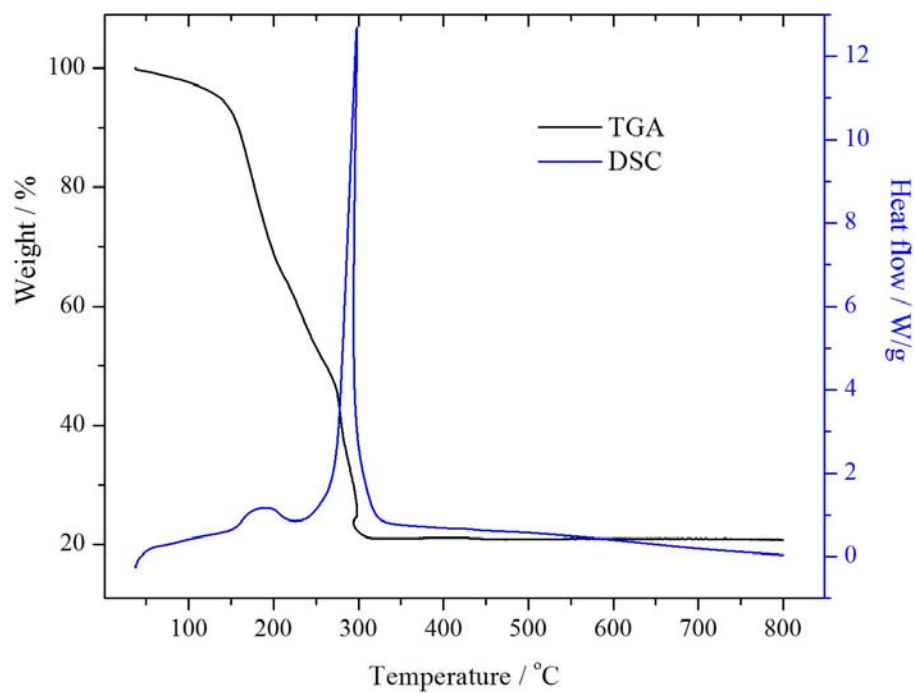


Fig. S1. TGA-DSC curves for Cr-Cu-citrate-nitrate dry gel.

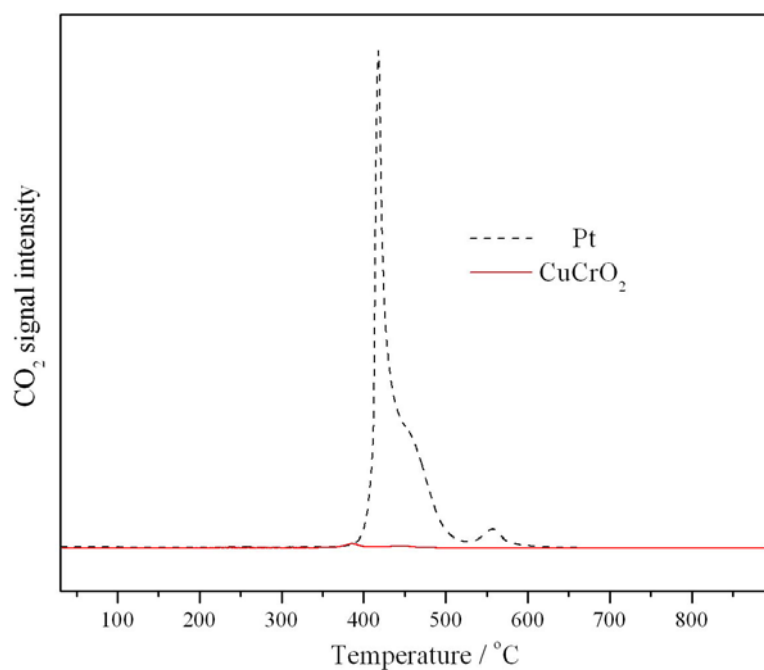


Fig. S2. O₂-TPO curves of CuCrO₂ and Pt anode catalyst powders after exposure in ethane at 700 °C for 10 h.

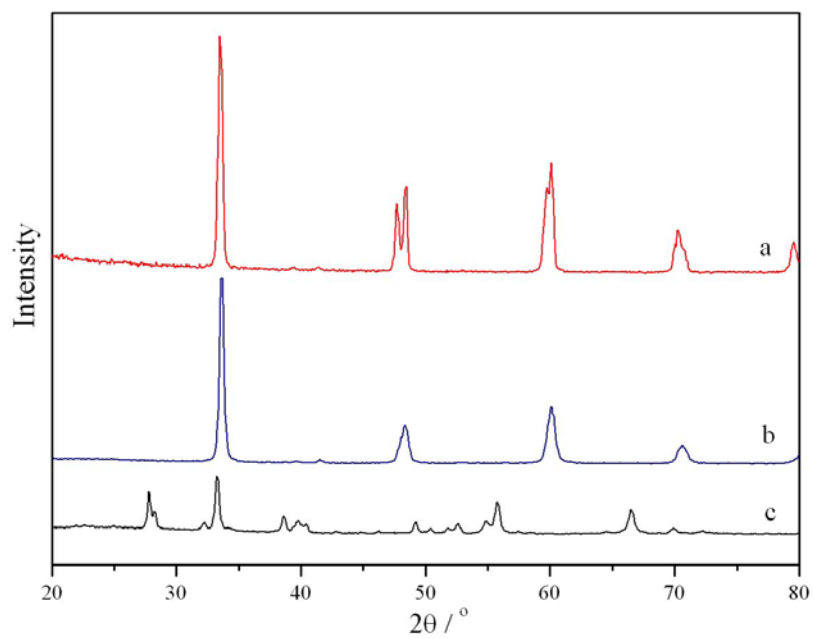


Fig. S3. XRD patterns of (a) BCZY membrane after sintering at 1600 °C, (b) BCZY powders after calcination at 1100 °C, (c) BCZY precursor powder after combustion.

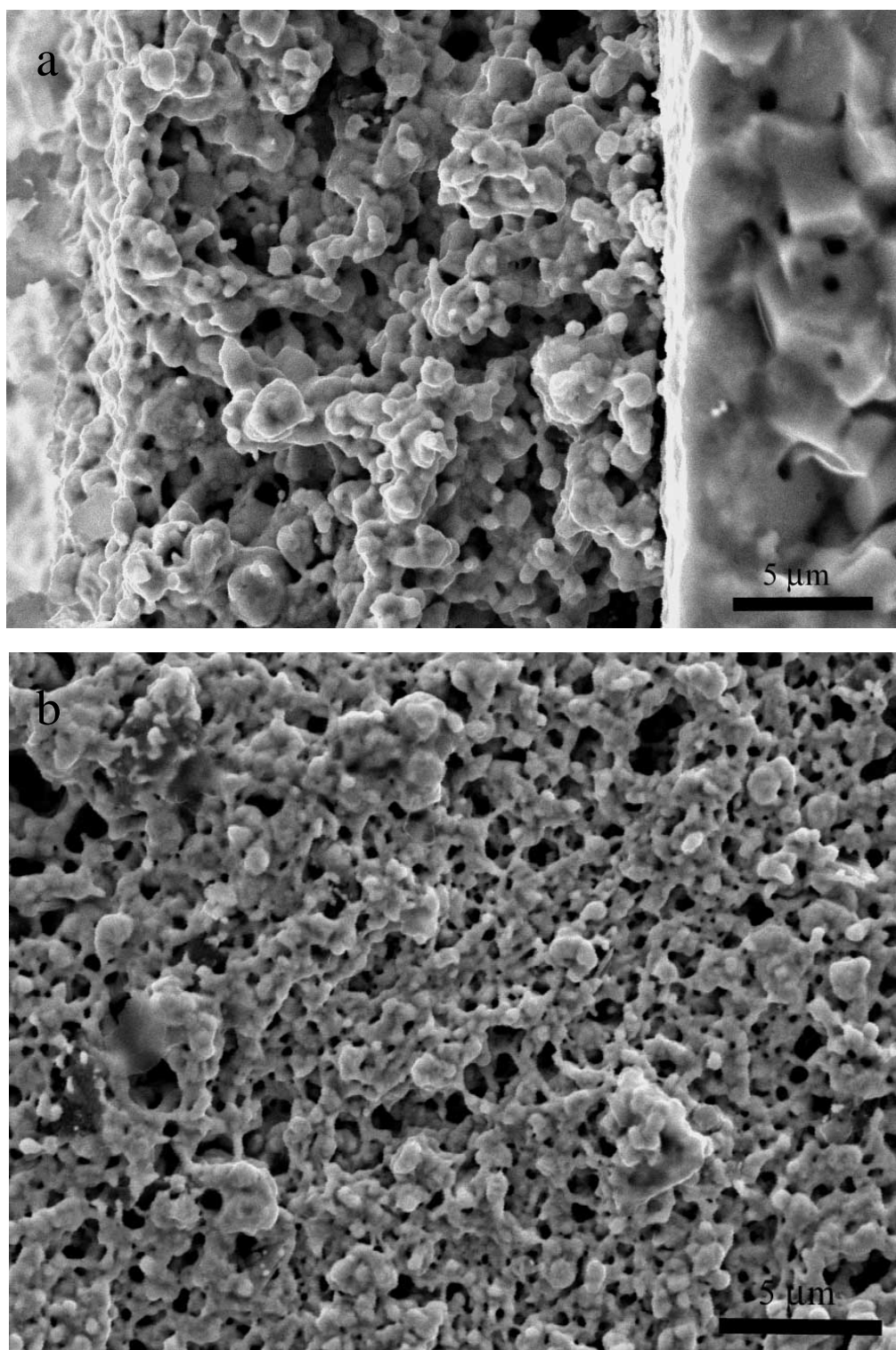


Fig. S4. (a) Cross-sectional and (b) surface SEM images of the Cu-Cr₂O₃ anode mixed with Au paste after proton conducting membrane SOFC reactor testing.

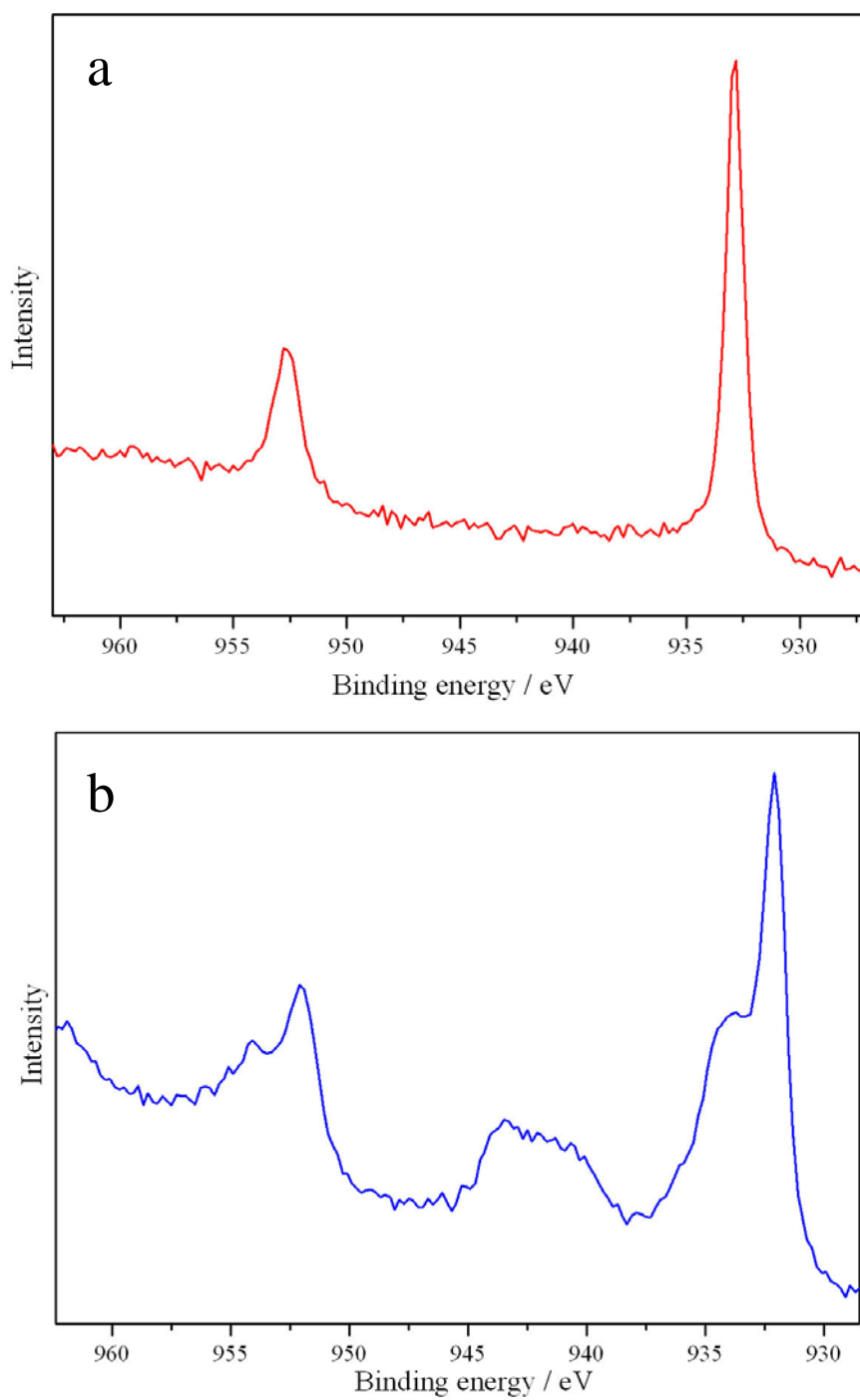


Fig. S5. XPS spectra of Cu over anode catalysts (a) before and (b) after testing.

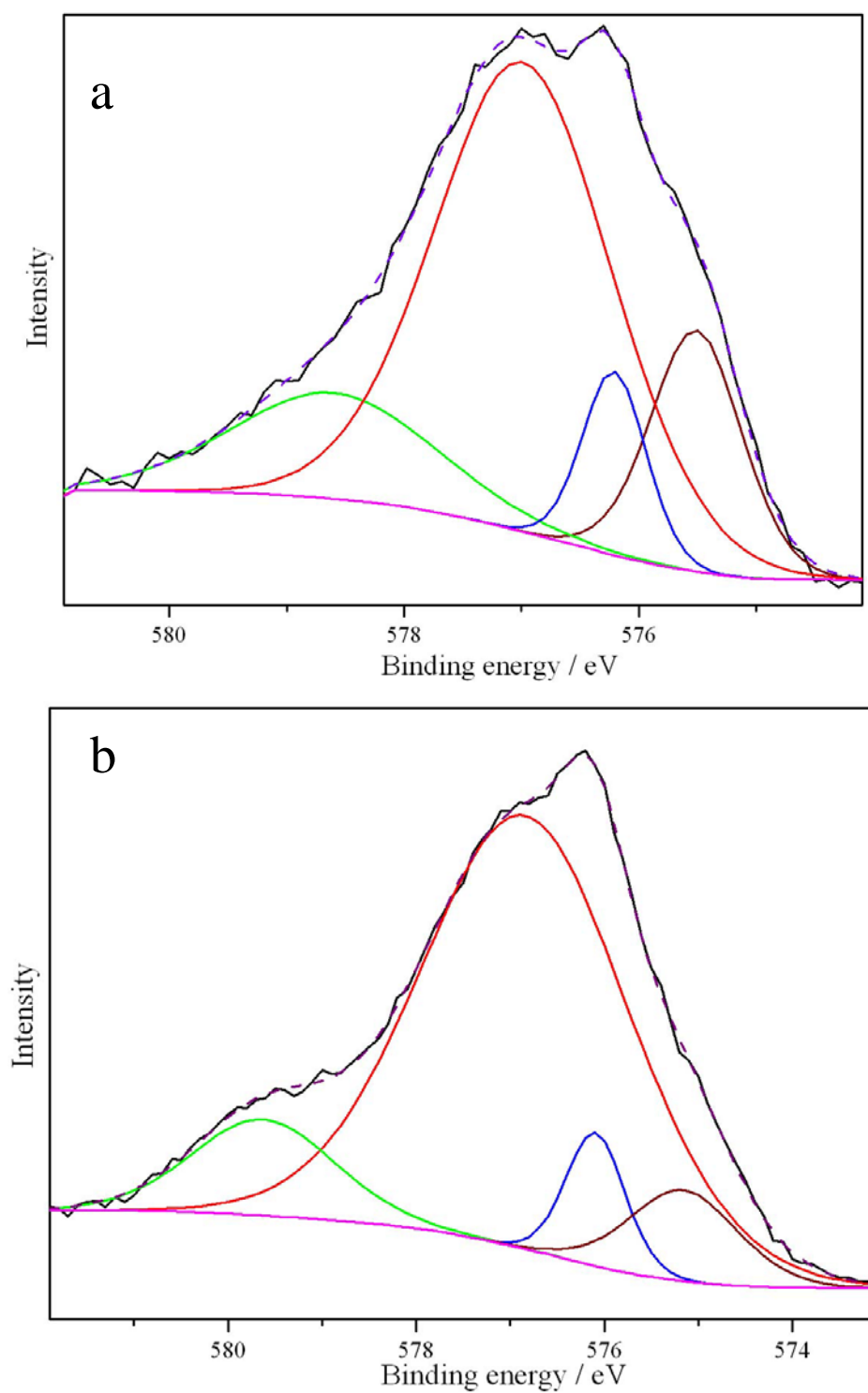


Fig. S6. XPS spectra of $\text{Cr}2p_{3/2}$ over anode catalysts (a) before and (b) after testing.