

Supplementary Information

A Microfluidic Photoelectrochemical Cell for Solar-driven CO₂ Conversion into Liquid Fuels with CuO-based Photocathodes

Evangelos Kalamaras^{a*}, Meltiani Belekoukia^a, Jeannie Z. Y. Tan^a, Jin Xuan^{b*}, M. Mercedes Maroto-Valer^a, John M. Andresen^{a*}

Research Centre for Carbon Solutions (RCCS), School of Engineering & Physical Sciences, Heriot-Watt University, Edinburgh, EH14 4AS, United Kingdom

Department of Chemical Engineering, Loughborough University, Loughborough, United Kingdom

**corresponding authors: ek15@hw.ac.uk (EK), j.xuan@lboro.ac.uk (JX), j.andresen@hw.ac.uk (JMA)*

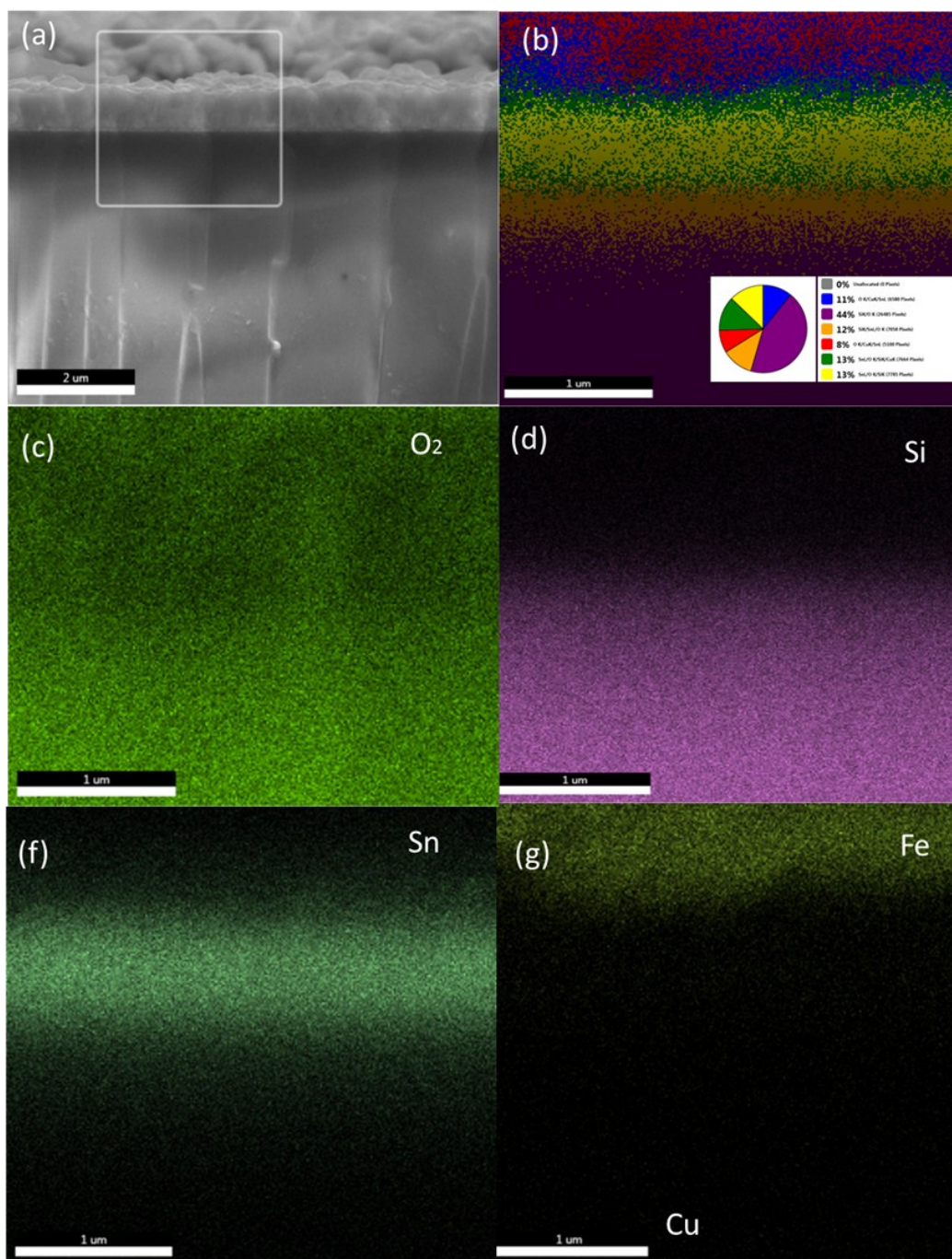


Fig. 1. SEM, EDAX characterization of as-synthesized CuO photoelectrodes a) cross-sectional SEM images and b-g) cross-sectional EDAX element overlay of CuO photoelectrodes.

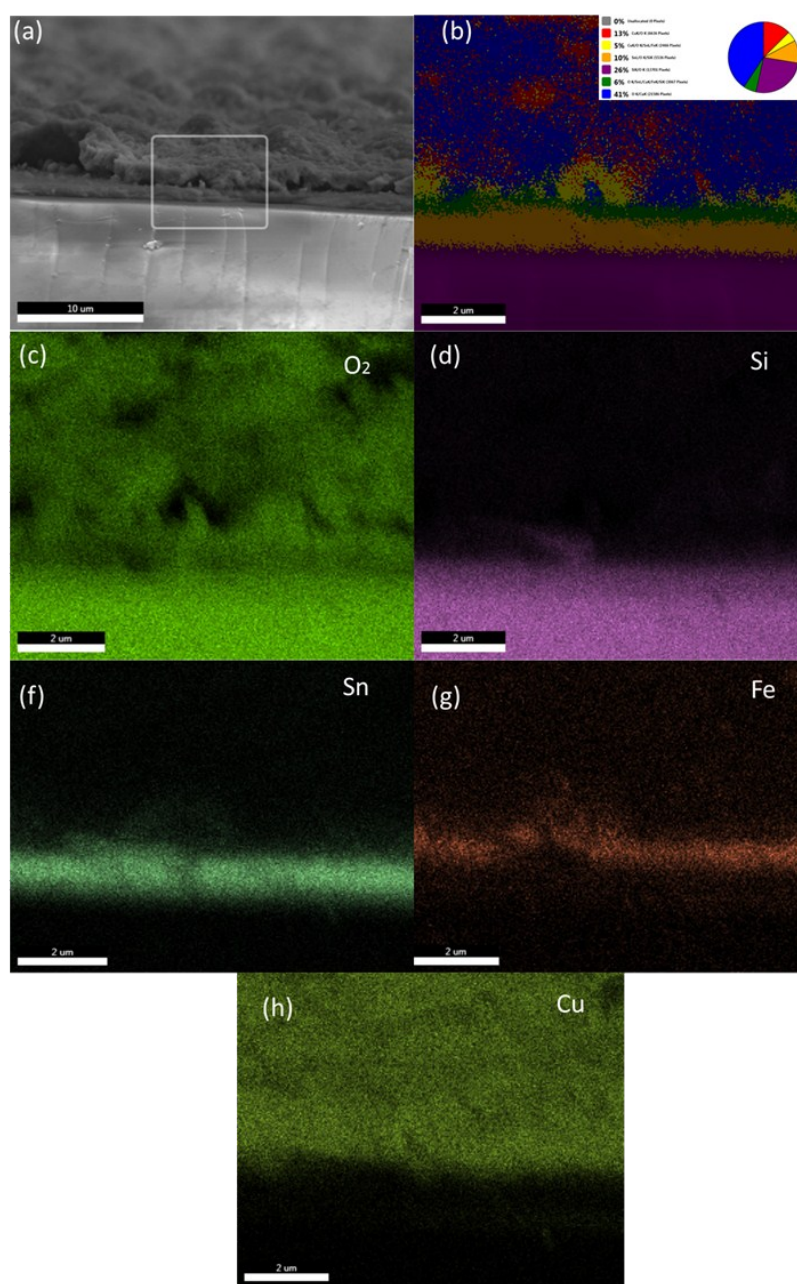


Fig. 2. SEM, EDAX characterization of as-synthesized $\alpha\text{-Fe}_2\text{O}_3/\text{CuO}$ photoelectrodes a) cross-sectional SEM images and b-h) cross-sectional EDAX element overlay of CuO photoelectrodes.

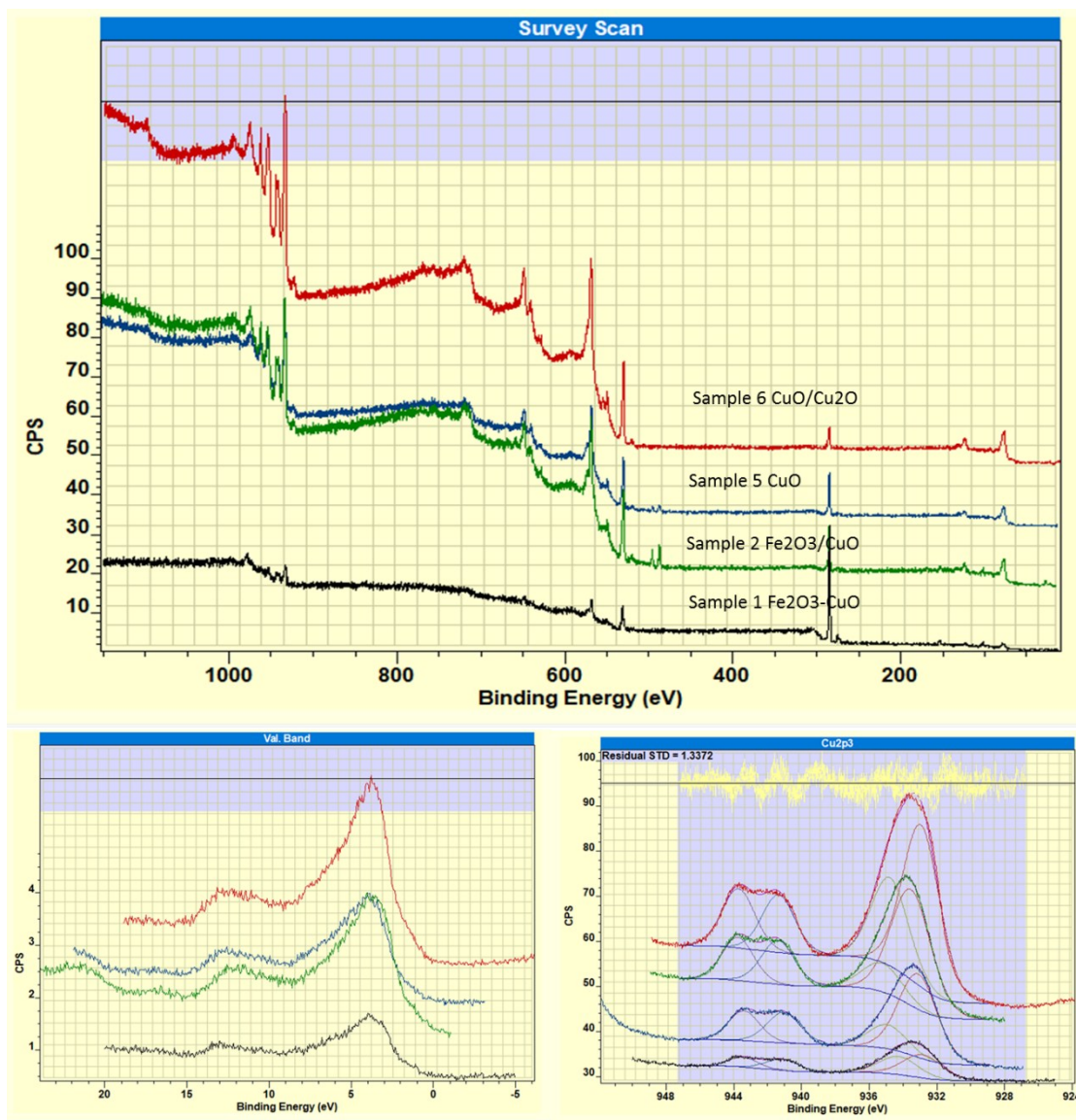


Fig. 3. X-ray photoelectron spectroscopy (XPS) characterization of as-synthesized CuO, CuO/Cu₂O and α -Fe₂O₃/CuO photoelectrodes

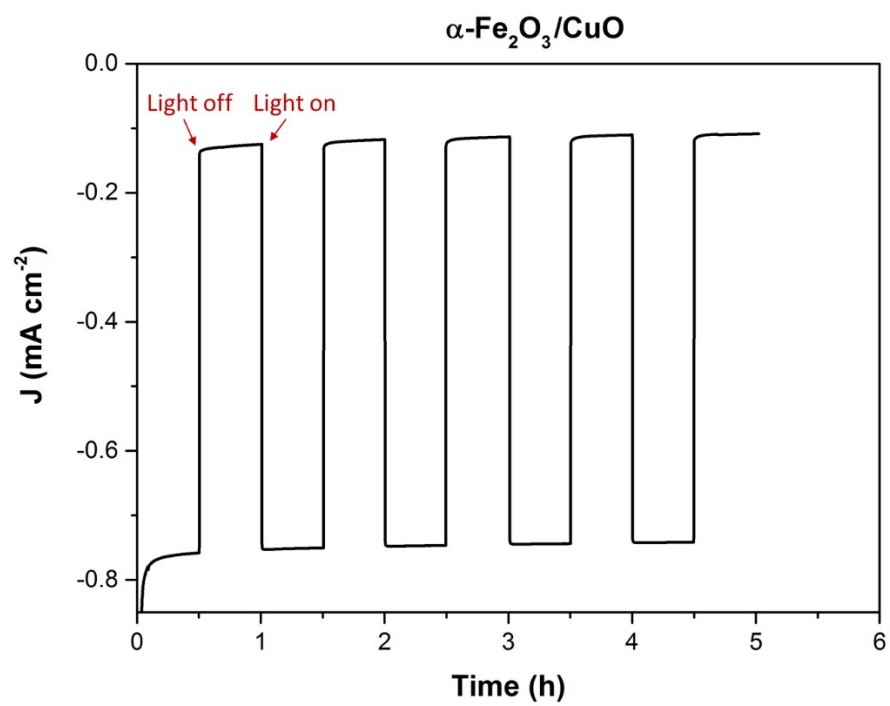


Fig. 4. Chronoamperometry characterization of $\alpha\text{-Fe}_2\text{O}_3/\text{CuO}$ photoelectrodes at 0.3 V vs RHE.