Electronic Supplementary Material (ESI) for Faraday Discussions.

Supplementary Information: Photocatalytic CO_2 Reduction by Topologically Matched Polymer-Polymer Heterojunction Nanosheets

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Methods

All reagents were obtained from Merk, TCI Europe, Ambeed or Alfa Aesar, and used as received. Anhydrous solvents were purchased from Merk and used without further purification. All gases for photocatalytic reactions were supplied by BOC at a purity of ≥99.999%. ^{1}H NMR spectra were recorded at ambient temperature on a 400 MHz Bruker spectrometer at 400 MHz (^{1}H) and referenced against the residual ^{1}H signal of the solvent. PESA spectra were recorded on a KP Technology APS02 system over wavelengths of ca. 180 – 280 nm. Polymer films were obtained by dropcasting from DMF suspension onto ITO. Photocatalysis measurements were conducted in a quartz reactor connected in flow with a custom Agilent 8890 GC System. The reactor was degassed thoroughly before analysis and filled with CO_2 to a pressure of 700 – 900 mbar. Gas products in the headspace were circulated using a solenoid pump and were sampled once per hour by automatic injection. Samples were cooled by a flow of water at 15°C around the reactor. Samples were illuminated from above using a Asahi Max-303 300W Xenon Light Source fitted with a UV-IR mirror module, an AM 1.5 G filter, a quartz light guide and a (1.0x) collimator lens. The intensity of light was adjusted to 1 sun using a Newport calibrated reference cell.

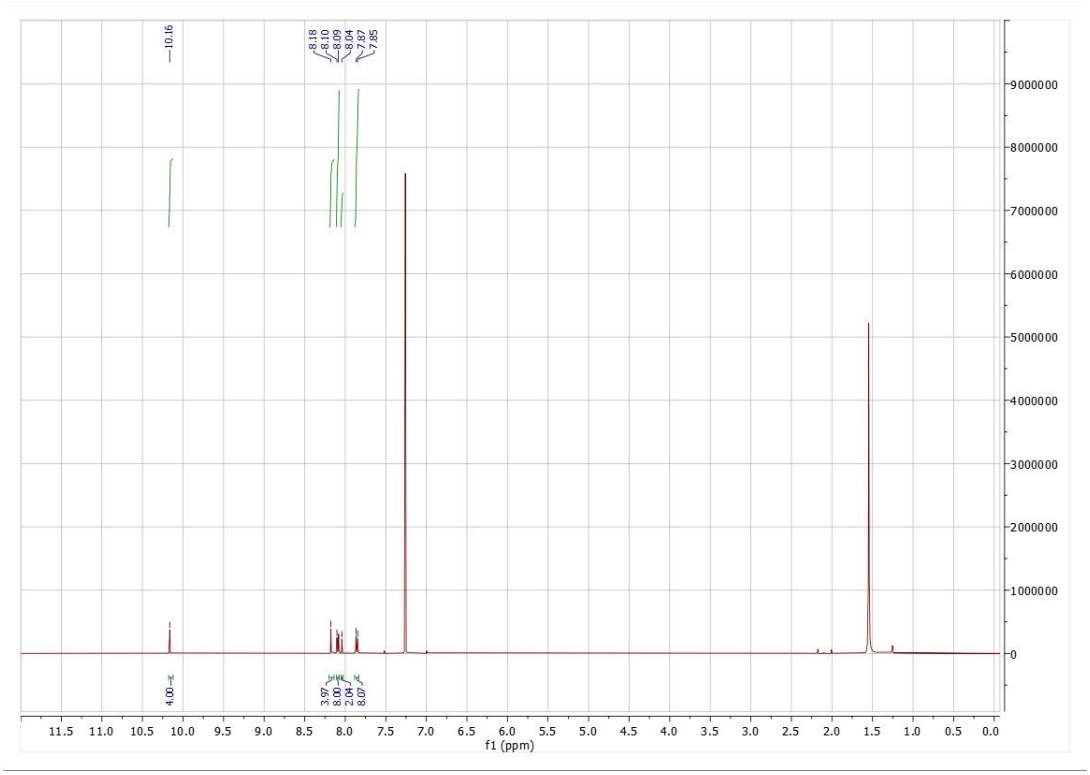


Figure S1: NMR spectra of M8

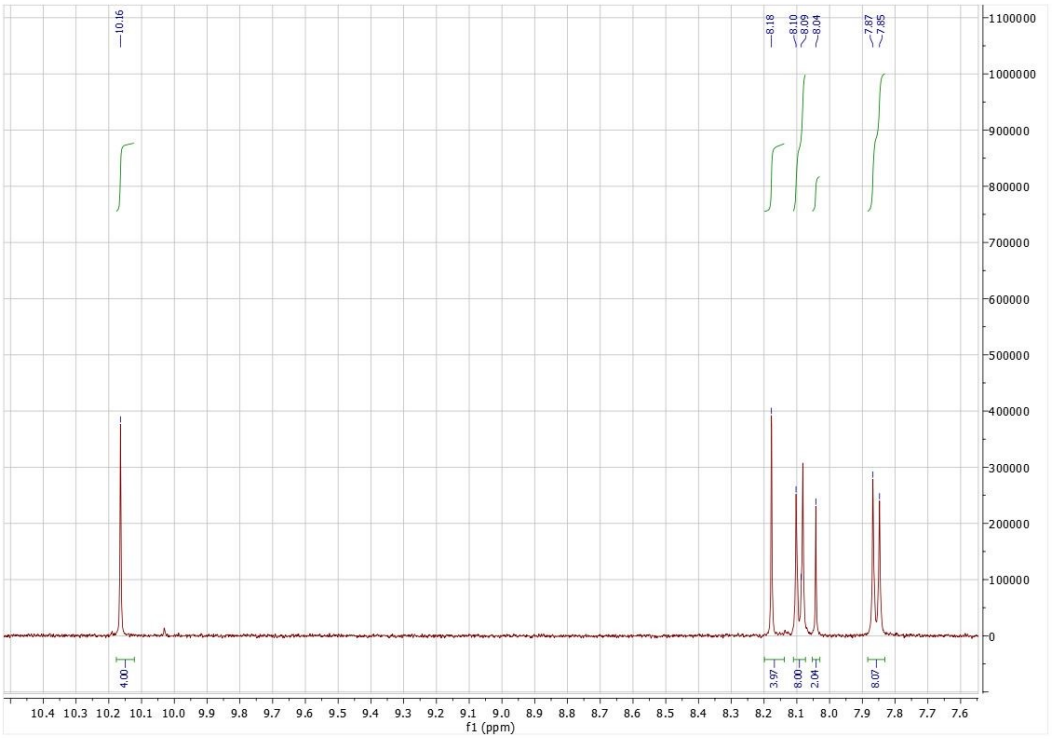


Figure S2: Zoomed in NMR spectrum of M8

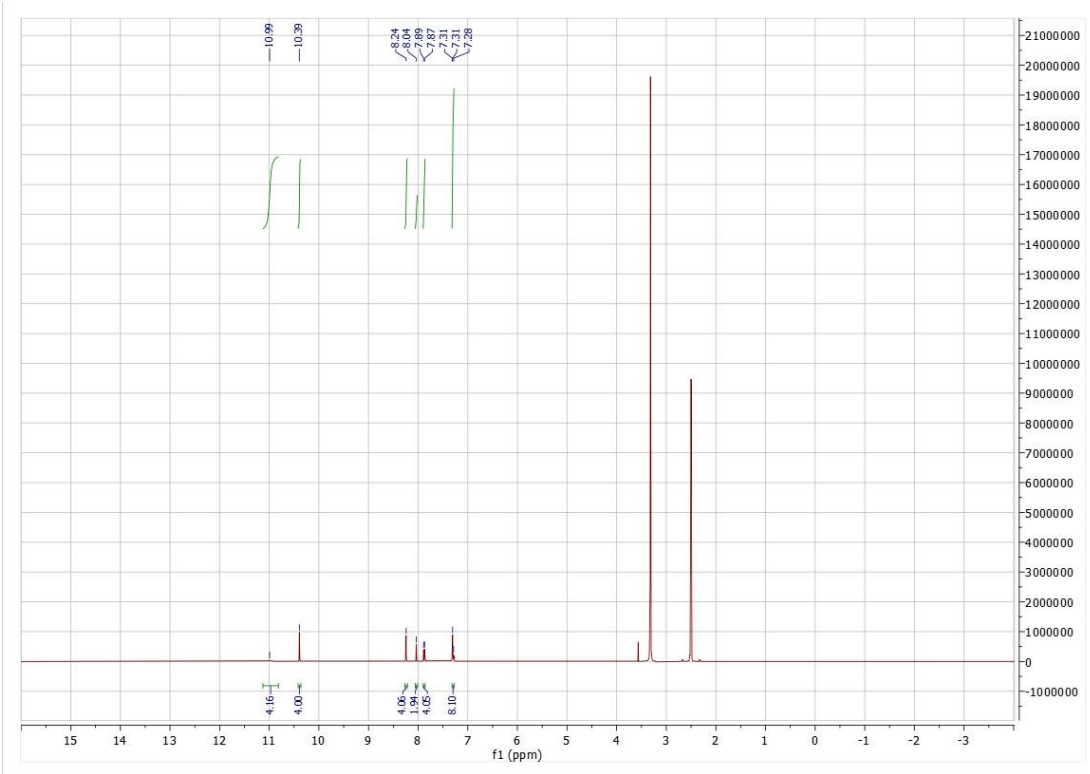


Figure S3: NMR spectrum of M6

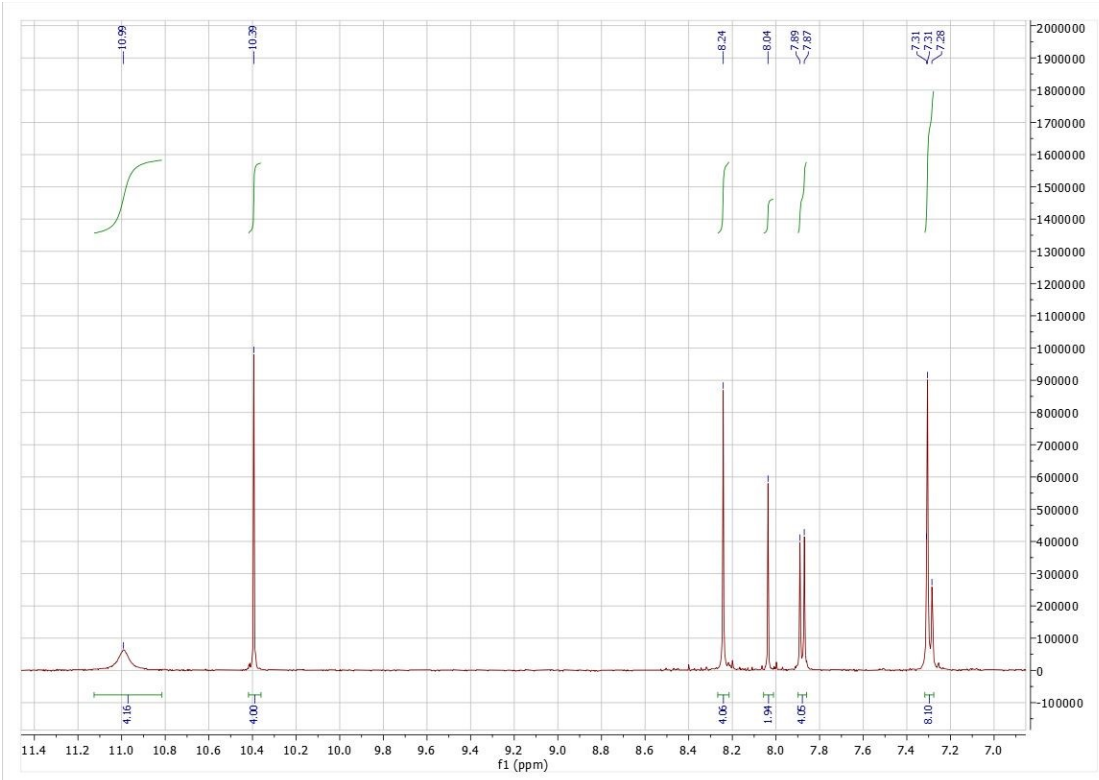


Figure S4: Zoomed in NMR spectrum of M6

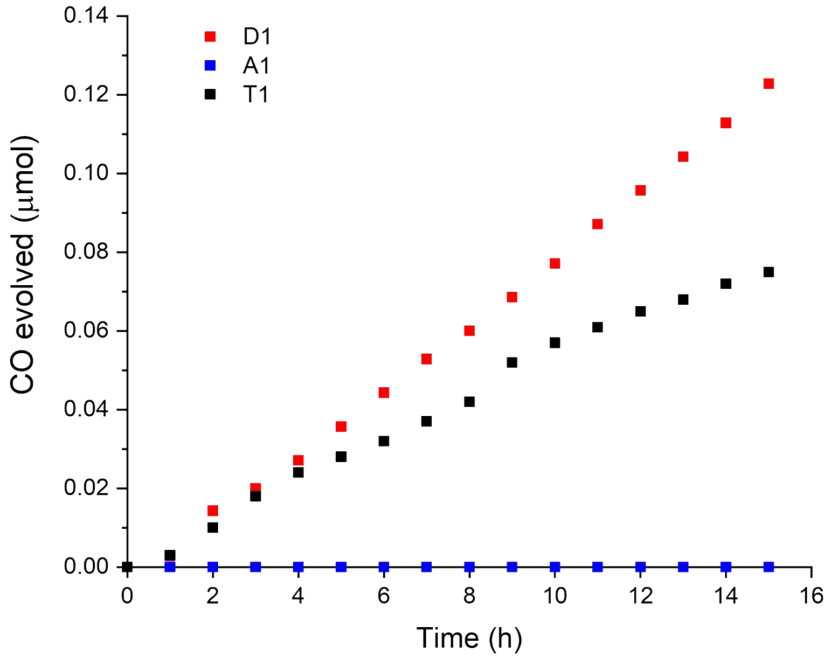


Figure S5: Photocatalysis of the Co-loaded group 5 polymers (2.5 mg) and 2,2'-Bipyridine (2 mg) in MeCN (32 mL) with TeOA (3 mL) under an atmosphere of CO_2

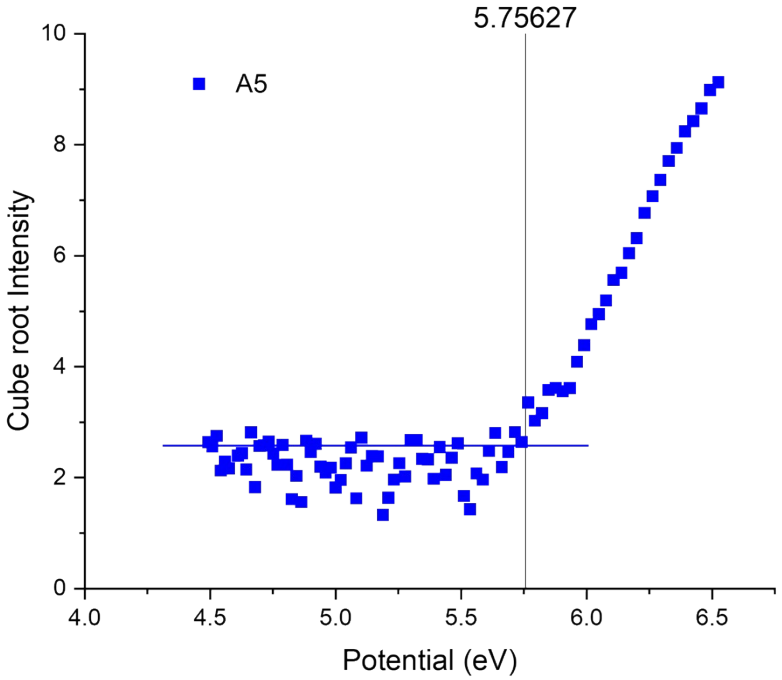


Figure S6: PESA spectrum of A5

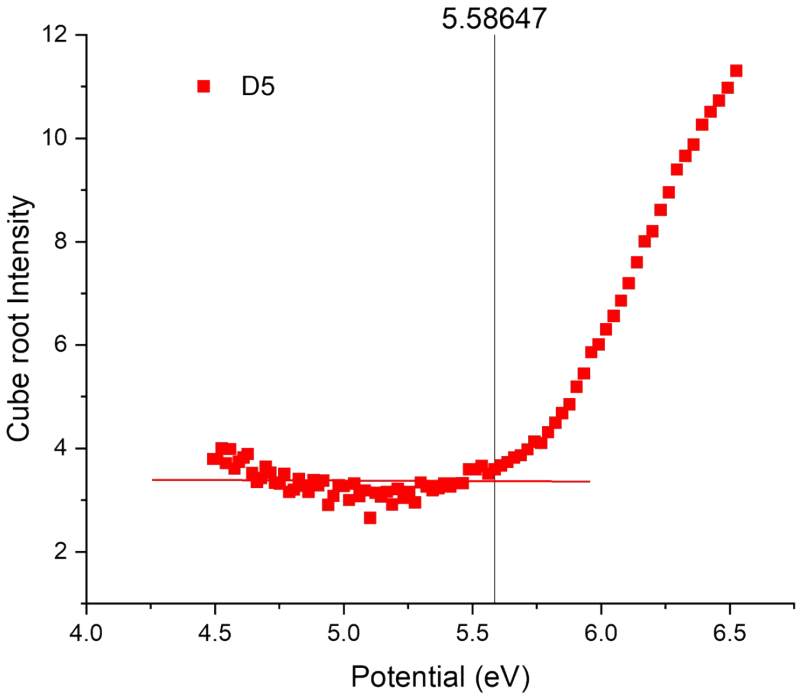


Figure S7: PESA spectrum of D5

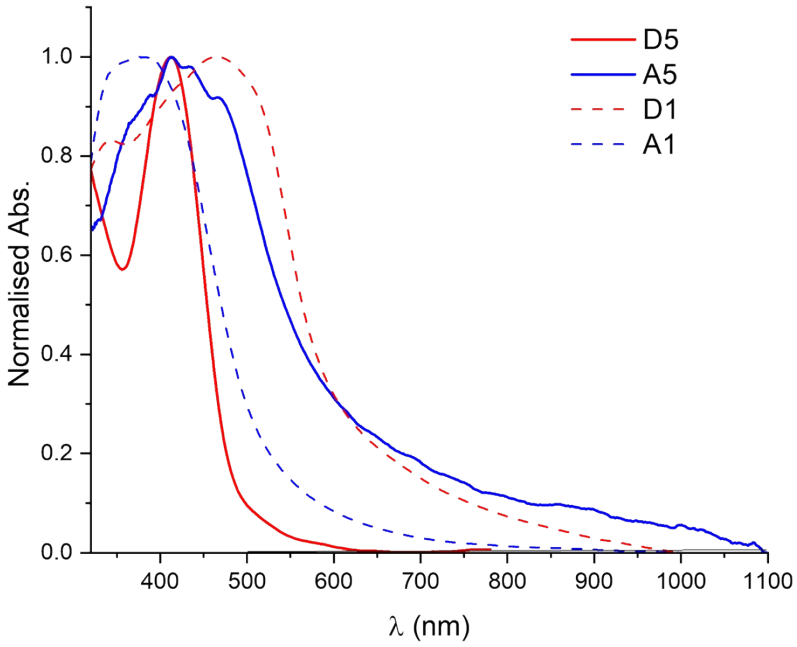


Figure S8: UV-Vis spectrum of the polymers in MeCN suspension.

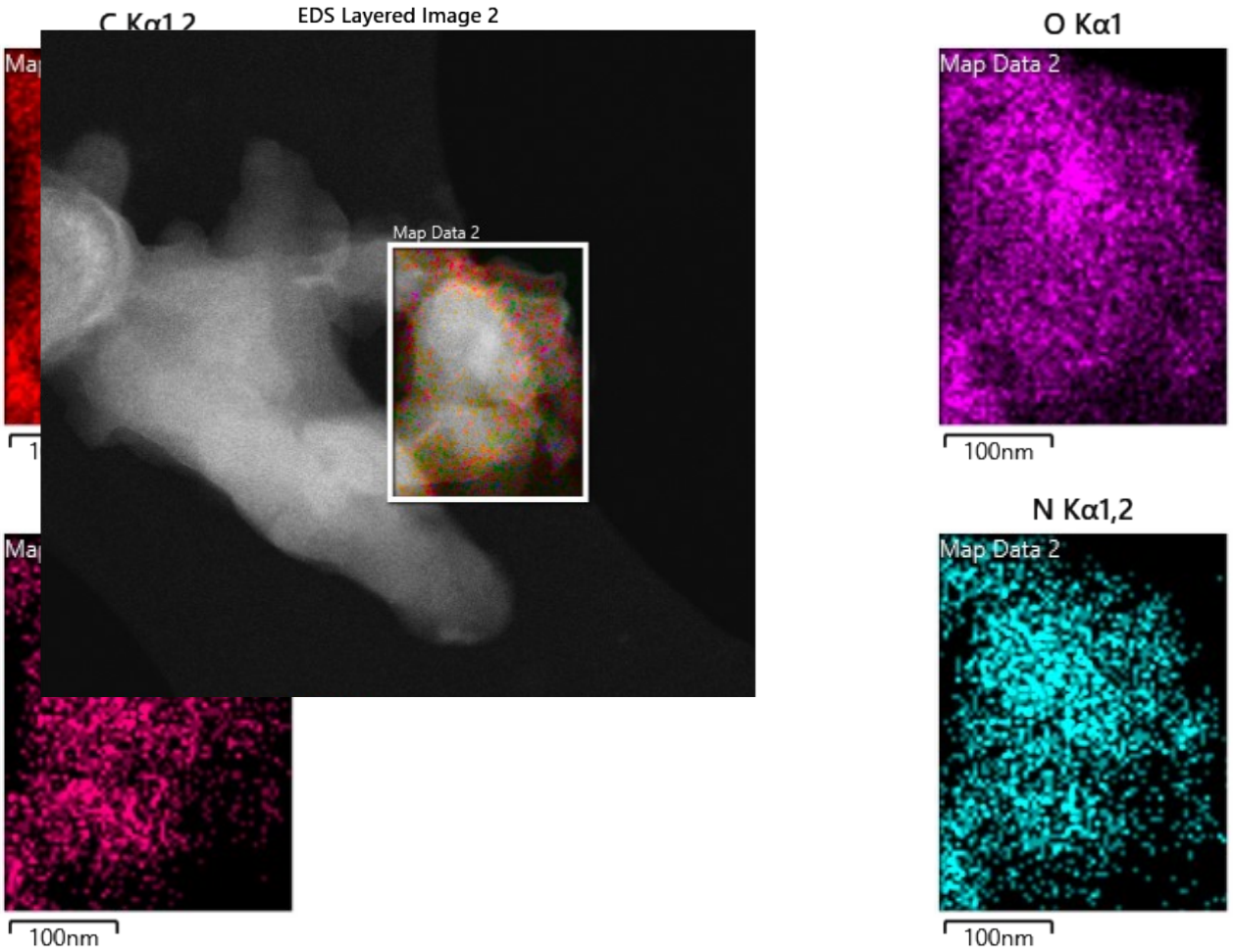
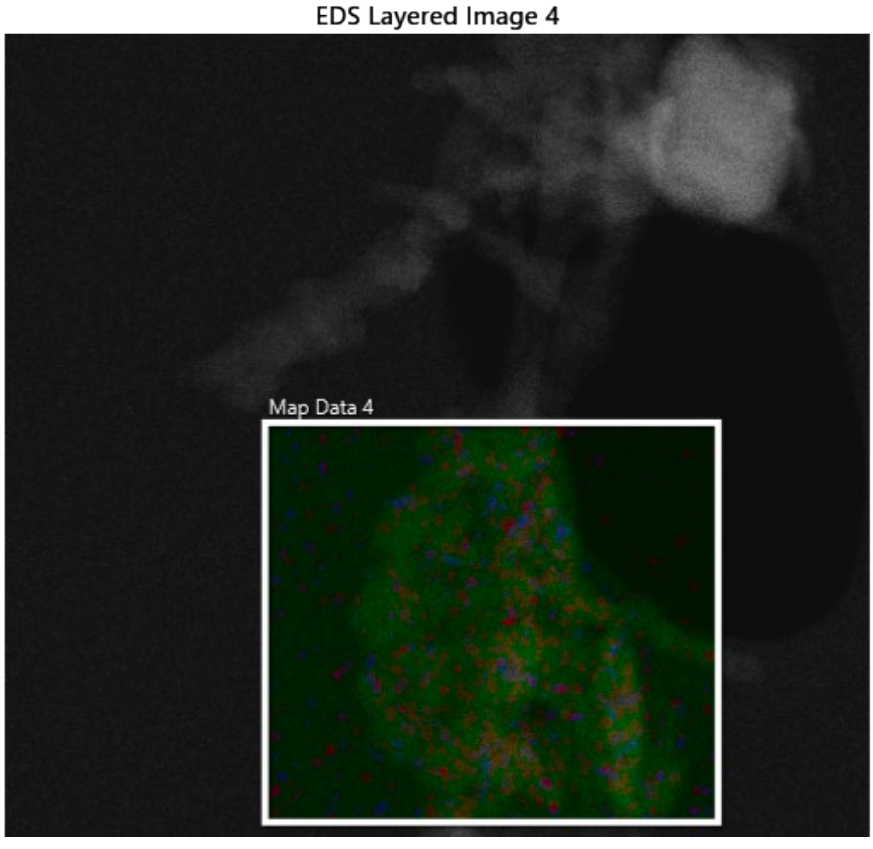


Figure S9: EDX mapping of D5 loaded with Co.



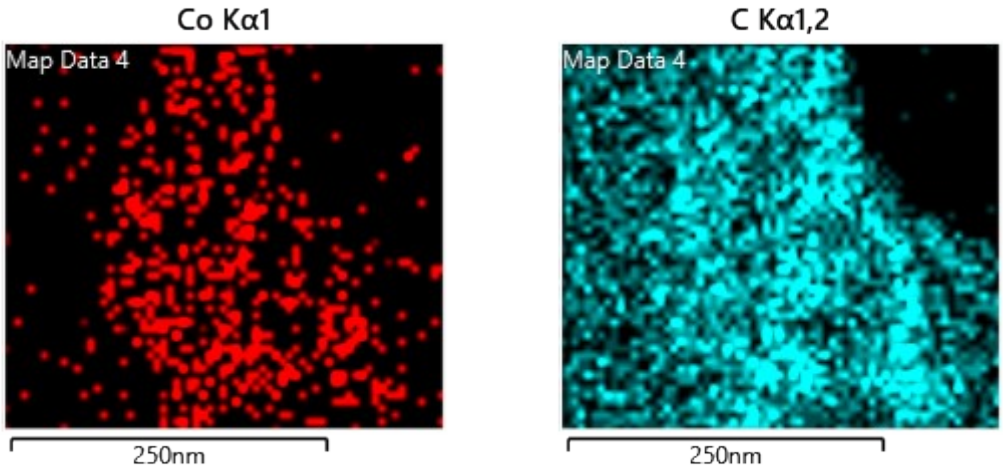


Figure S10: EDX mapping of A5 loaded with Co.