Electronic Supplementary Material (ESI) for Dalton Transactions.

Supporting Information:

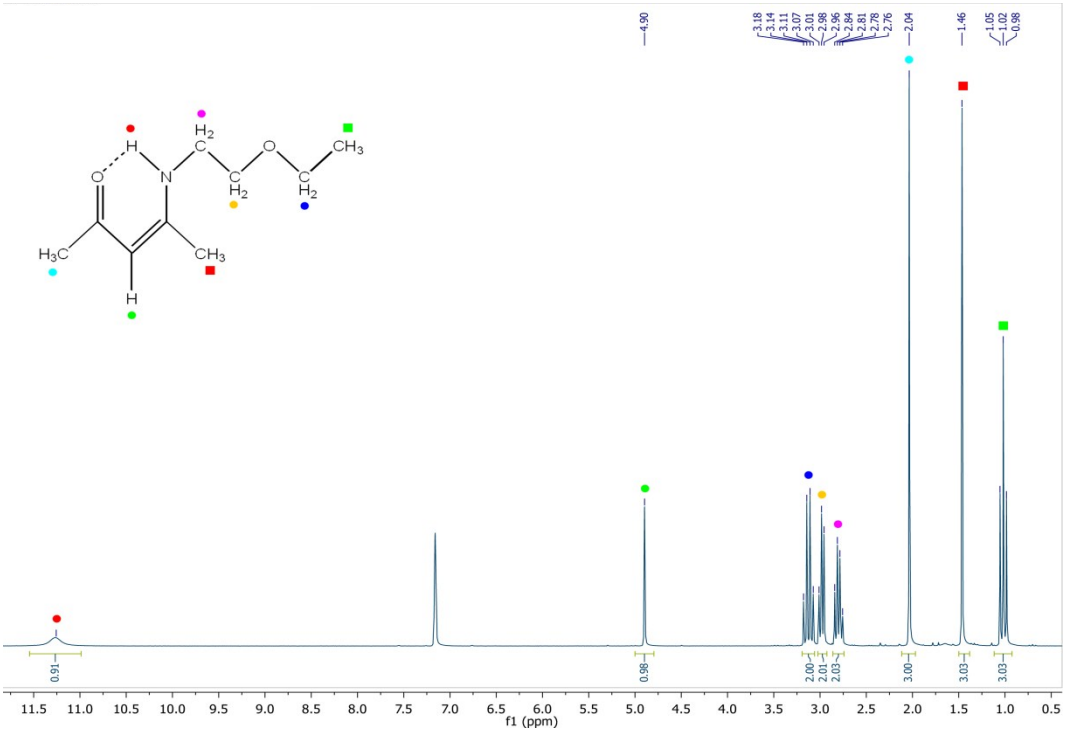

Fig. S1 ^{1}H NMR spectrum of the *β*-ethoxyethylamine ligand (EEKI) recorded at 200 MHz in C_6D_6.

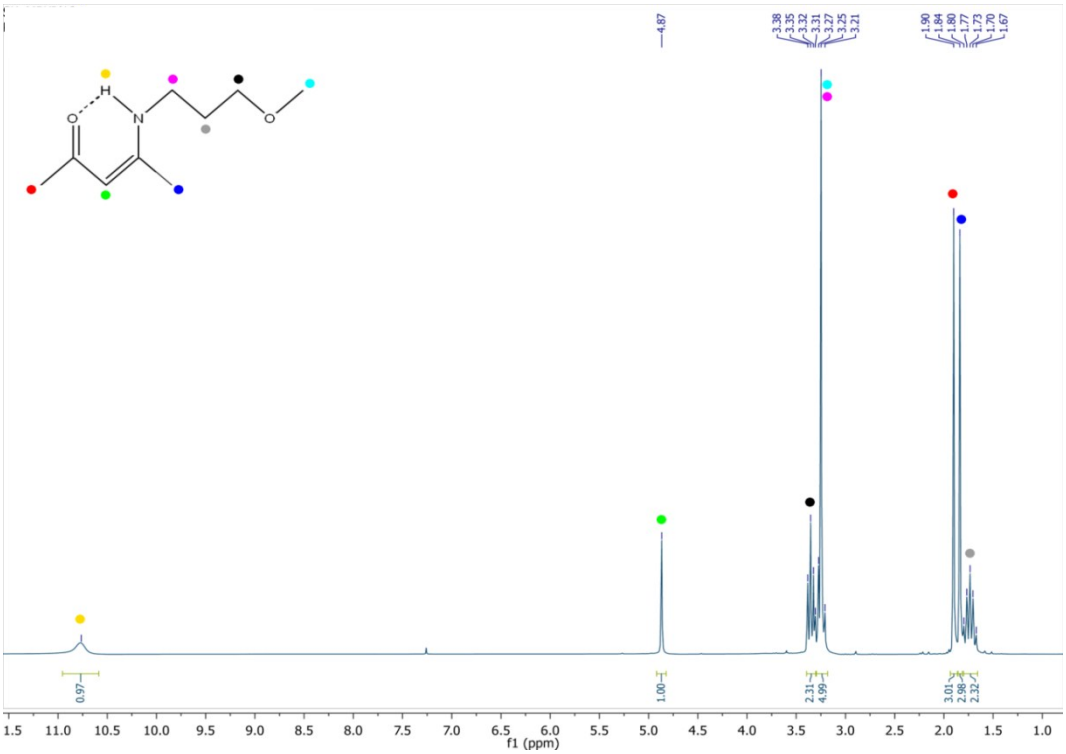

Fig. S2 ^{1}H NMR spectrum of the *β*-methoxypropylamine ligand (MPKI) recorded at 200 MHz in C_6D_6.

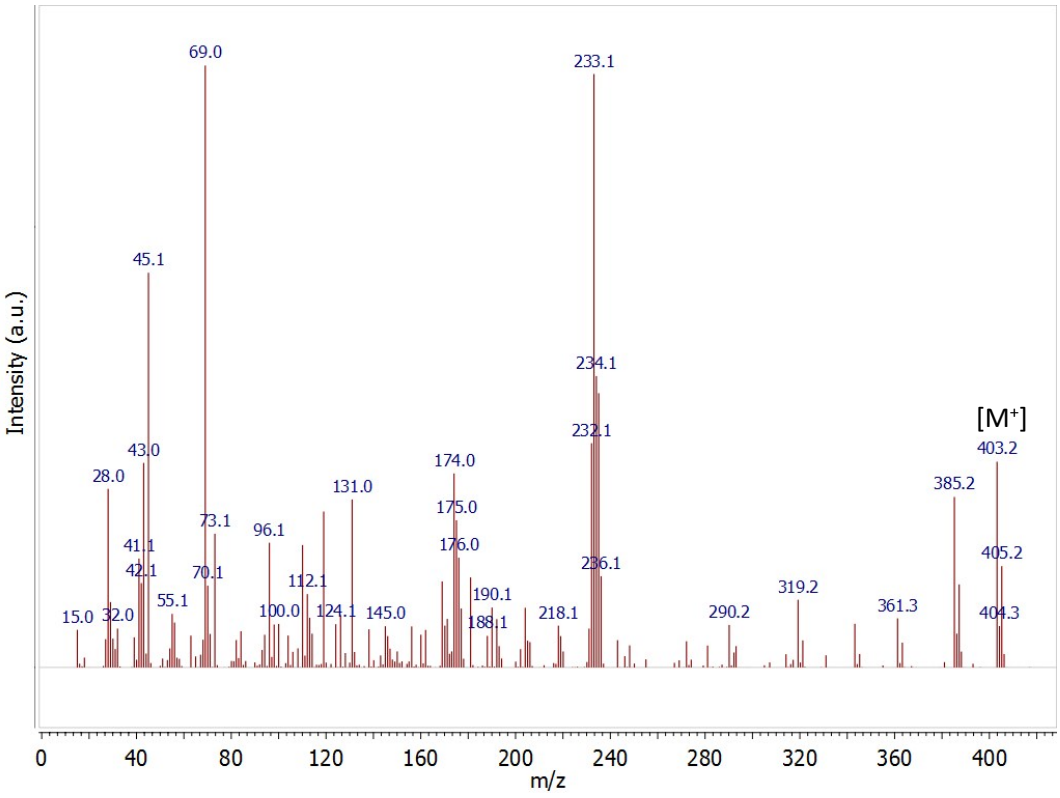

Fig. S3 EI-mass spectrum of $[Cu(EEKI)_2]$ (70 eV).

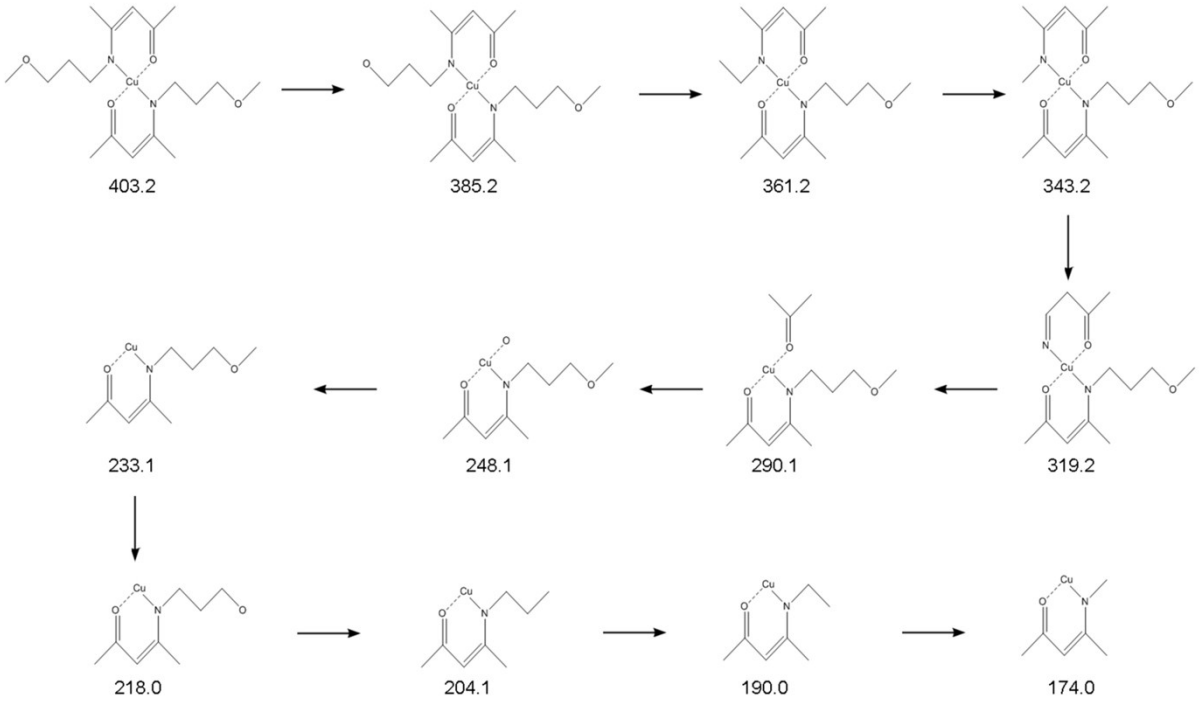

Fig. S4 Proposed fragmentation pattern for $[Cu(MPKI)_2]$ based on the EI-MS data shown in Fig. 1.

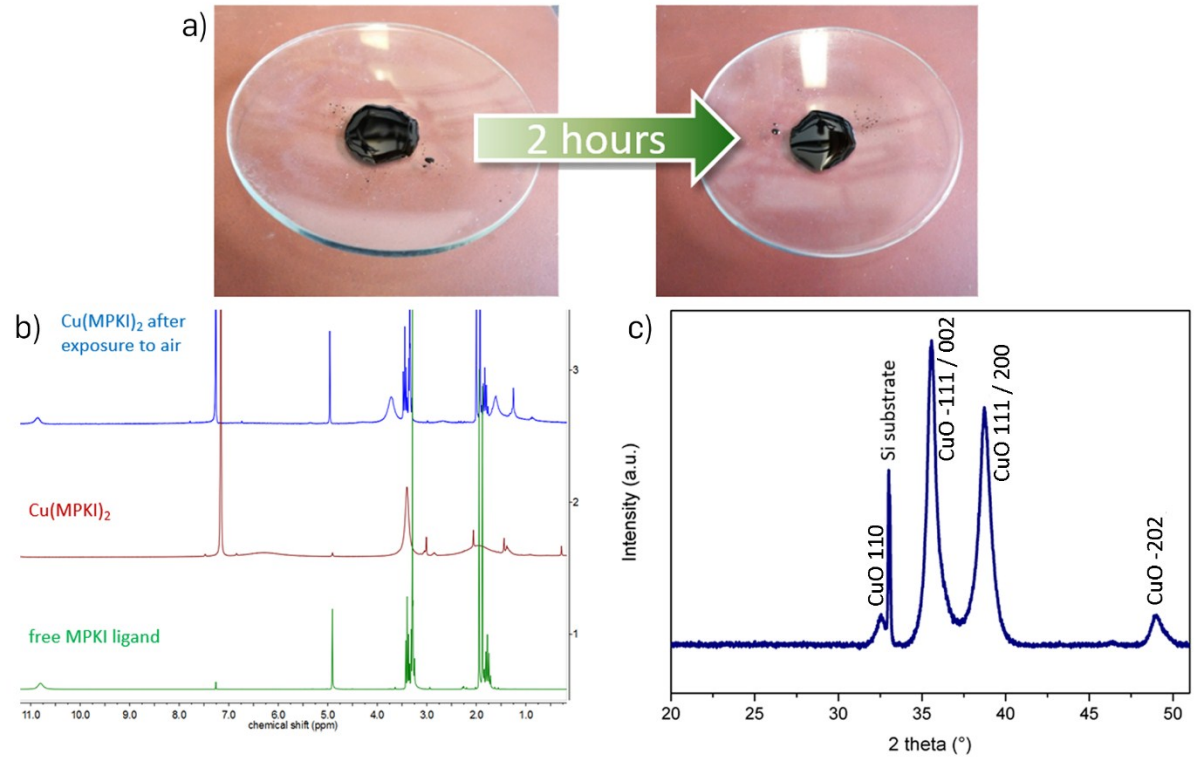

Fig. S5 a) Photographs of [Cu(MPKI)$_2$] after a few seconds in ambient air (left) and after 2 hours under ambient conditions (right), b) NMR spectra of free MPKI ligand (green), the intact [Cu(MPKI)$_2$] complex (red) and the [Cu(MPKI)$_2$] sample after 2 hours in ambient air (blue). The slight shift in the blue curve originates from a different NMR solvent. From the stacked spectra a cleavage of free ketoimine ligand can clearly be observed. c) XRD pattern recorded of the solid residue after a few drops of [Cu(MPKI)$_2$] were put on a 300 °C hot Si(100) substrate and kept for 5 min at 300 °C in air. The XRD confirms the formation of CuO under the given conditions.

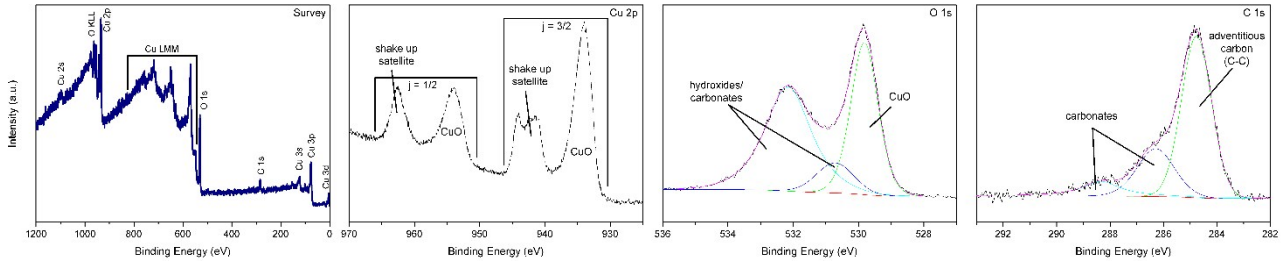

Fig. S6 XPS survey and core level spectra of an as-deposited copper oxide sample surface.

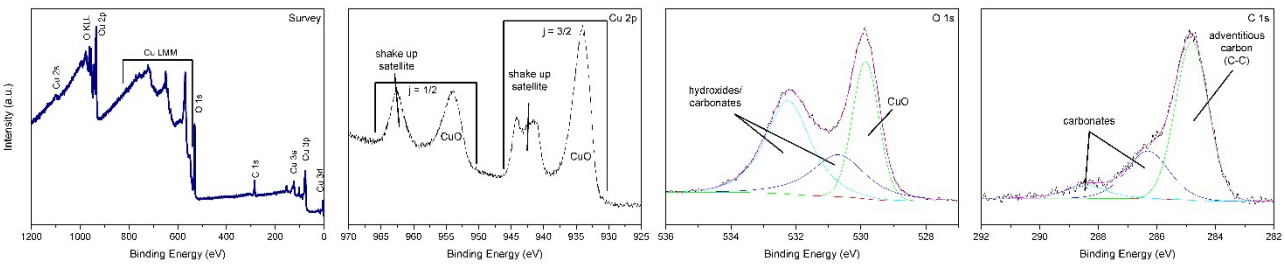

Fig. S7 XPS survey and core level spectra of a copper oxide sample surface after annealing at 600 °C for 2 hours under ambient conditions.

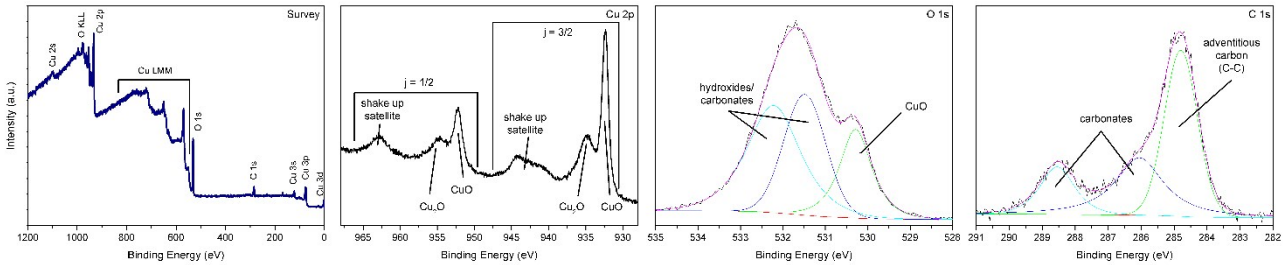

Fig. S8 XPS survey and core level spectra of a copper oxide sample surface after annealing for 2 hours under N_2 flow at 600 °C.

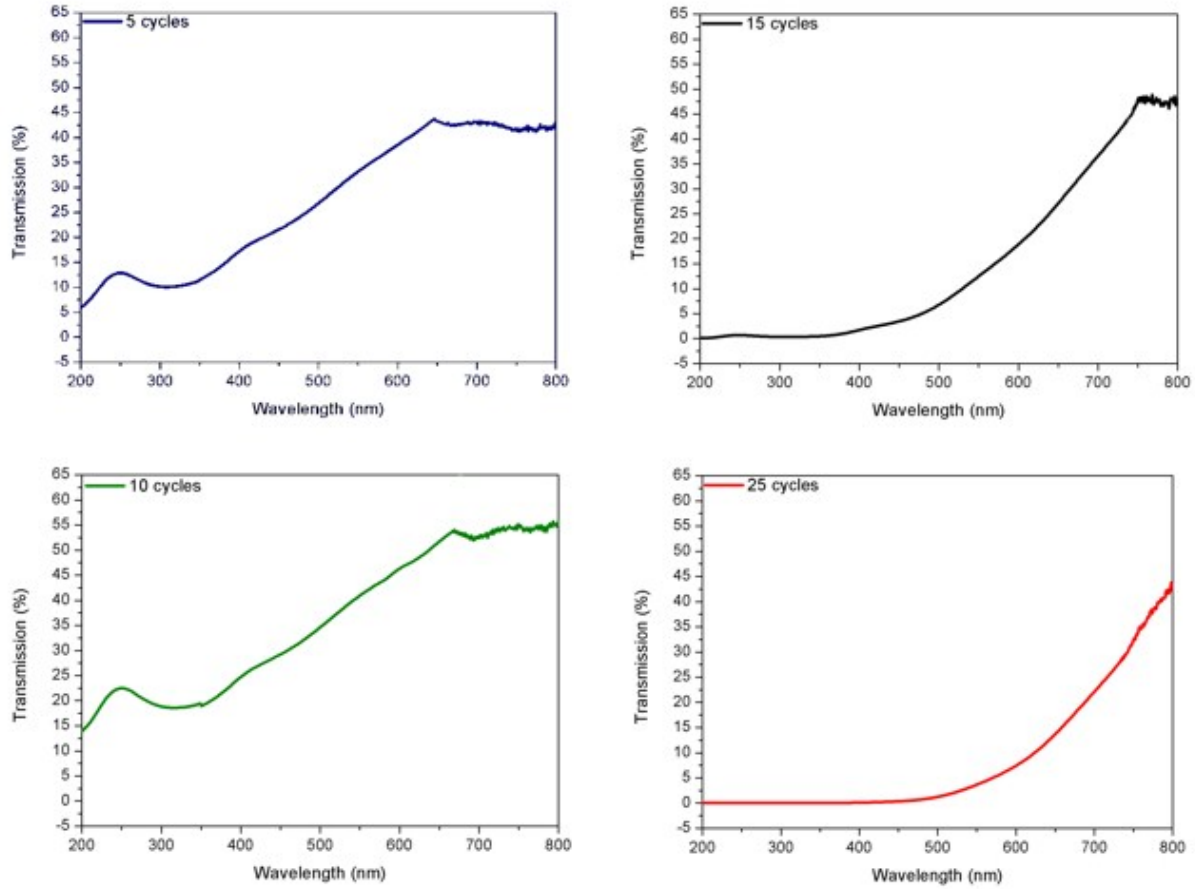

Fig. S9 UV/Vis transmittance spectra of CuO thin films deposited on Si(100) as a function of deposition cycles and annealed at 600 °C in air.

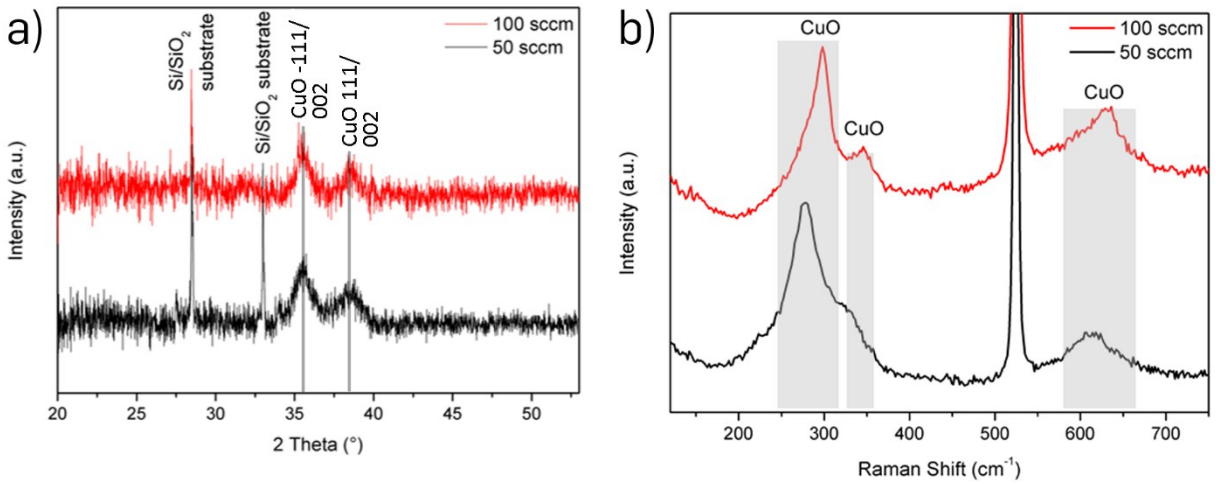

Fig. S10 a) XRD pattern of CuO thin films on 200nm thermally grown SiO_2 after annealing in 50 sccm (black) and 100 sccm (red) O_2 flow. b) Raman spectra of CuO thin films deposited on thermally grown SiO_2 after annealing in 50 sccm (black) and 100 sccm (red) O_2 flow. The intense signal at 520 cm^{-1} can be attributed to the substrate. The XRD patterns as well as the Raman spectra show no indication of the presence of another phase than CuO (*i.e.* Cu or Cu_2O).