SUPPLEMENTARY INFORMATION

DOI:

Title: Self Reduction of Copper Complex MOD Ink for Inkjet Printing Conductive Patterns on Plastics

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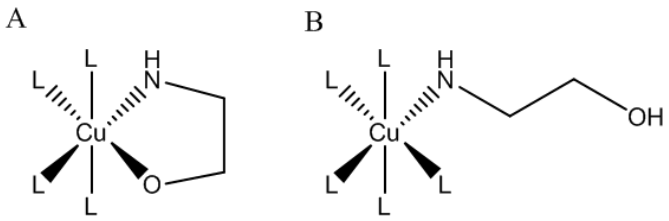
1. Experimental

Preparation of copper complex ink:
To fabricate the Cu ion ink used in this study, 50 mmol of copper formate dihydrate was poured into a beaker containing a mixture of 90 mmol AMP, 70 mmol of DM, and 20 mmol n-Butanol. In this manner, highly viscous ink was obtained.
For inkjet printing, low viscous ink is required (8-15 cP). This ink was prepared by adding 50 mmol of dihydrated copper formate to a mixture of 90 mmol AMP, 200 mmol Diethylene glycol methyl ether (DM), and 40 mmol n-Butanol.
First tests for the production of copper complex films were performed by drawing down the ink onto a glass substrate, using the drawing rod method; the wet thickness was 18 microns.

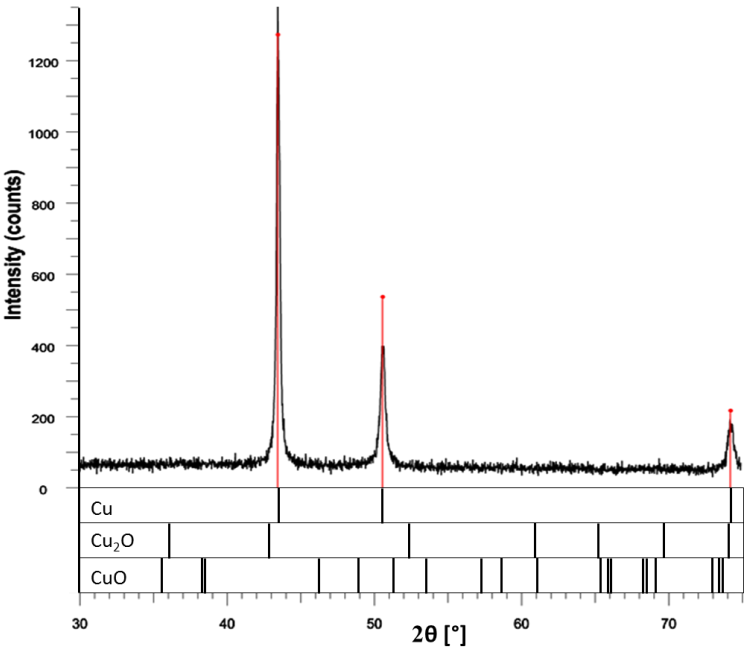
2. Copper ligand-binding forms

Figure S1: (A) and (B) illustrates the various binding forms of the ligand to the copper, either as bidentate bond or monodentate bond.



3. X-Ray diffractogram

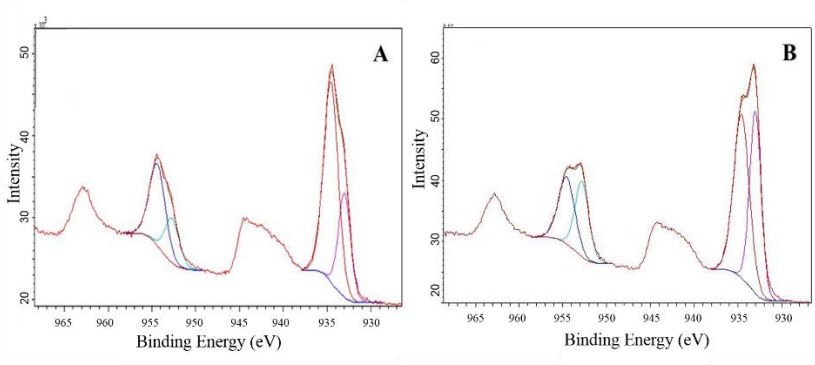
Figure S2: XRD pattern of the obtained copper nanoparticles with the reflection of peak positions of pure copper, copper (I) oxide, and copper (II) oxide for comparison.



4. X-Ray Photoelectron Spectroscopy

Figure S3: XPS analysis of the copper formate complex (CuF-AMP):

According to XPS analyses of the complex, (A) before and (B) during initial decomposition, the copper ions are present in two different oxidation states (933 eV and 953 eV for monovalent and 935 eV and 955 eV for divalent)[1].



1(a) V. K. P. Steiner, I. Sander, B. Siegwart, S. Hüfner, C. Politis, R. Hoppe, H. P. Müller, *Zeitschrift für Physik B Condensed Matter*, 1987, **67**, 497; (b) F. Xu, W. Huang and X.-Z. You, *Dalton Transactions*, 2010, **39**, 10652; (c) M. J. Begley, P. Hubberstey and J. Stroud, *Polyhedron*, 1997, **16**, 805.