

Supplementary Information

Sequential Growth of Bistable Photomagnetic Copper-Molybdenum Coordination Nanolayers on Inorganic Surfaces

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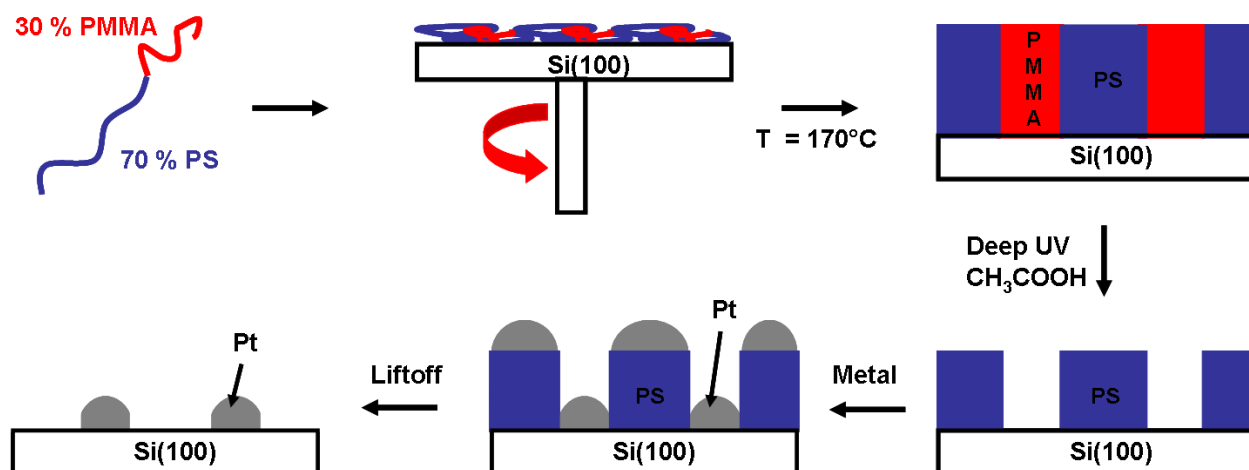
Electronic supplementary information (ESI) available: Experimental details – including the preparation of the samples and supplementary characterizations: infrared and XPS files.

Physical measurements

- Attenuated Total Reflection Fourier Transformed InfraRed Spectroscopy (ATR-FTIR) was performed on a IFS-66 spectrometer with a MCT detector. The silicon substrates were analyzed with a multi-reflections system (75 reflections) on 35 x 17.5 x 0.45 mm cut prisms with two 45° polished in opposition extremities. The platinum substrates were analyzed with a mono-reflection system in grazing incidence IRRAS (InfraRed Reflection Absorption Spectroscopy) geometry.
- Infrared measurements under light irradiation at low temperature were performed in transmission on a spectrometer, using a cryostat. The two sides of the sample were irradiated successively at 10 K using a 475-nm diode laser light with a power of $\sim 20 \text{ mW.cm}^{-2}$ at the surface of the substrate.
- Atomic Force Microscopy (AFM) images were taken in tapping-mode with a Nanoscope III using Si tips and with the Nanosensor at a resonance frequency of 236 KHz. Several AFM images were taken at different positions on the substrates and showed homogeneous results for all the samples. The roughness was obtained with AFM facilities by averaging the roughnesses of all the images acquired for one sample. The size distribution was calculated on all the images taken for the sample.

X-ray Photoelectron Spectroscopy (XPS) was performed on a KRATOS Axis Ultra spectrometer using a monochromatic Al K α source at 1486.6eV. The vacuum in the sample chamber was about 5×10^{-9} Torr during the measurements. The detector was calibrated to get the Au(4f) $7/2$ line at 84 eV. The Fe(2p) core levels were recorded with 150 Watt power source and 20eV pass energy.

Figure A. Fabrication of the platinum dots.



- **Figure S1.** Infrared spectra of the CN groups of the precursor $\text{K}_4[\text{Mo}(\text{CN})_8]\cdot 2\text{H}_2\text{O}$ (2102 and 2126 cm^{-1}) and the bulk material $\text{Cu}_2[\text{Mo}(\text{CN})_8]\cdot 8\text{H}_2\text{O}$ (2162 cm^{-1}).

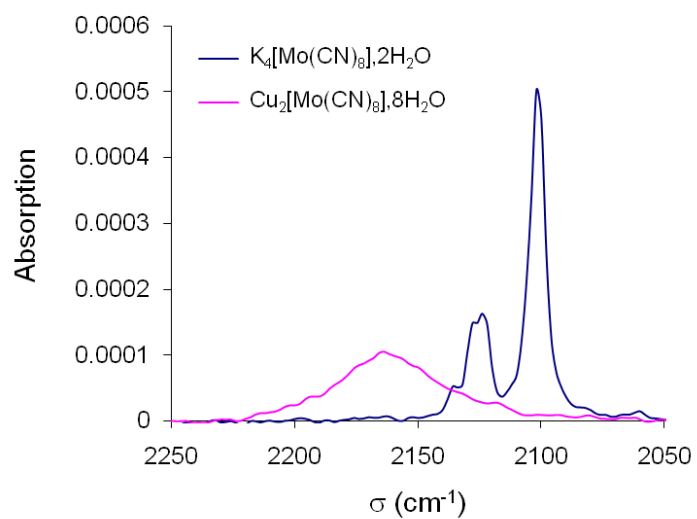


Figure S2. a) Evolution of the infra-red absorbance of the cyanide band from the step *Mo1* to the step *Cu6* on functionalized silicon with rinsing of the *Mon* steps with water and the *Cun* steps with methanol, and peak area at each step. b) Same spectra with the baseline shifted at each cycle for clarity.

a)

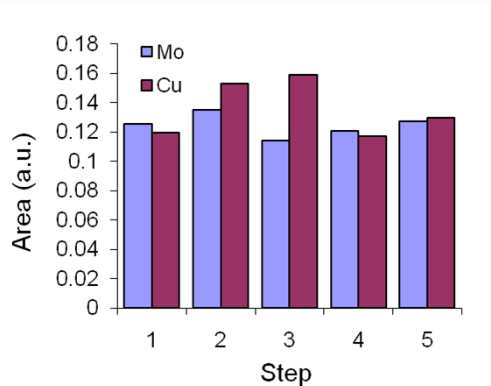
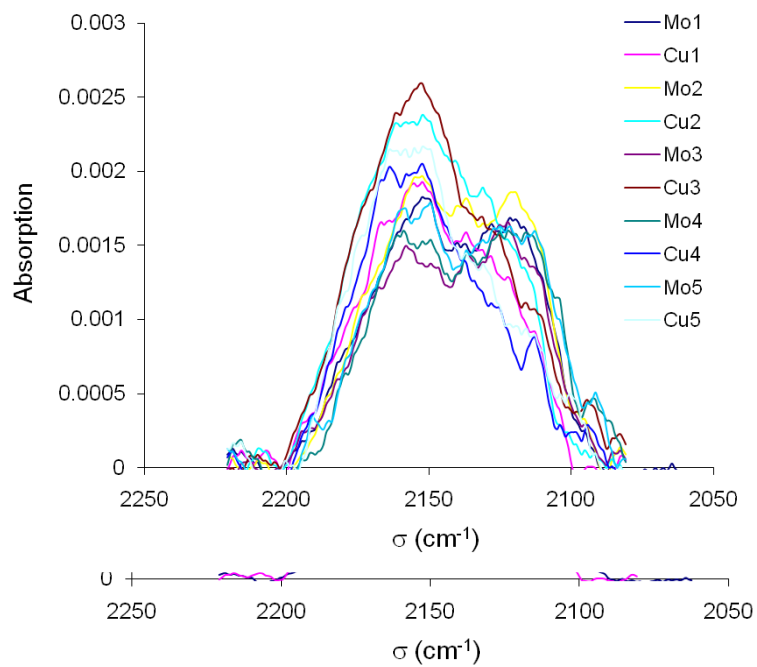


Figure S3. XPS spectra at Mo3d and Cu2p edges after six cycles of SGS of the copper-molybdenum network on functionalized silicon.

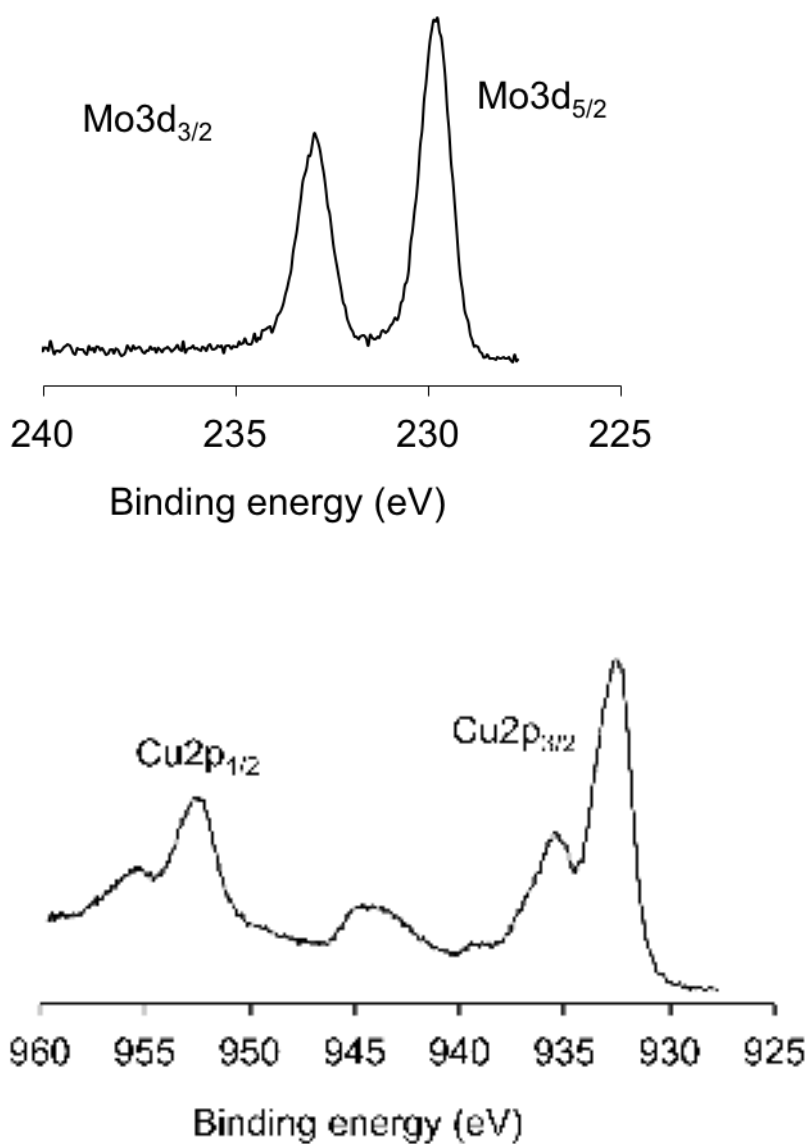


Figure S4. XPS spectra at Mo3d and Cu2p edges after six cycles of SGS of the copper-molybdenum network on bare platinum.

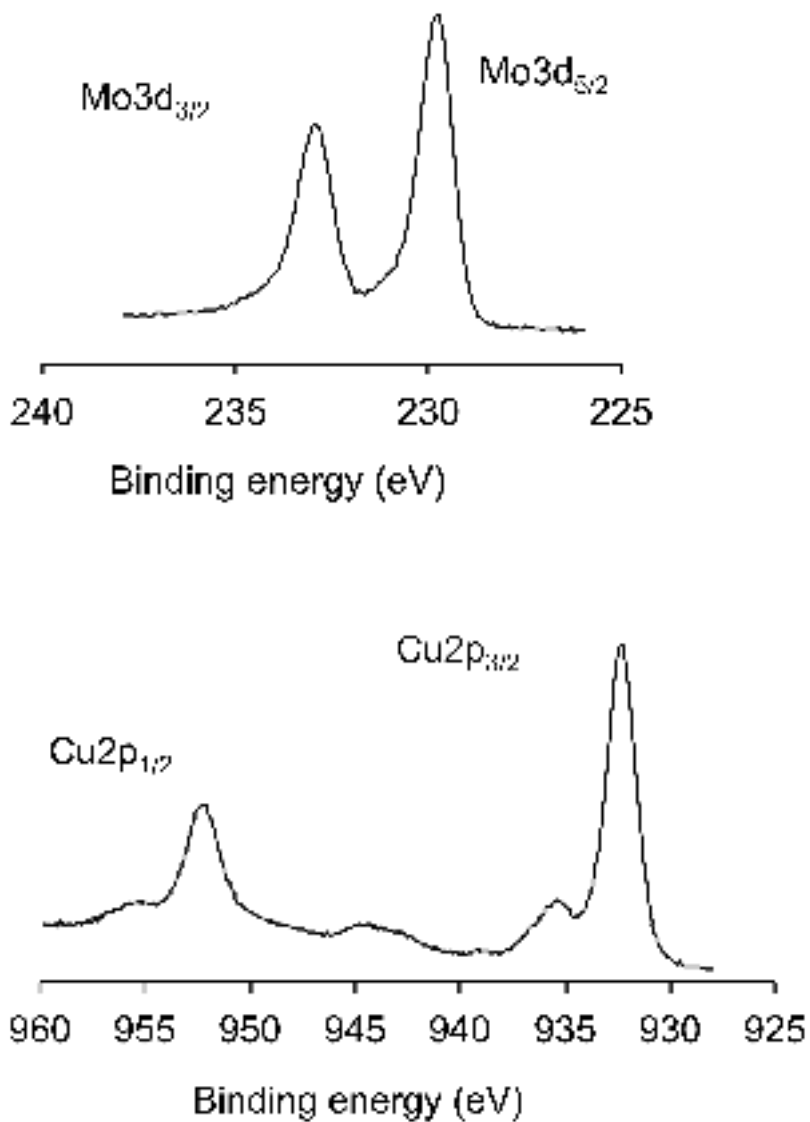


Figure S5. XPS spectra at Mo3d and Cu2p edges after three cycles of SGS of the copper-molybdenum network on platinum dots.

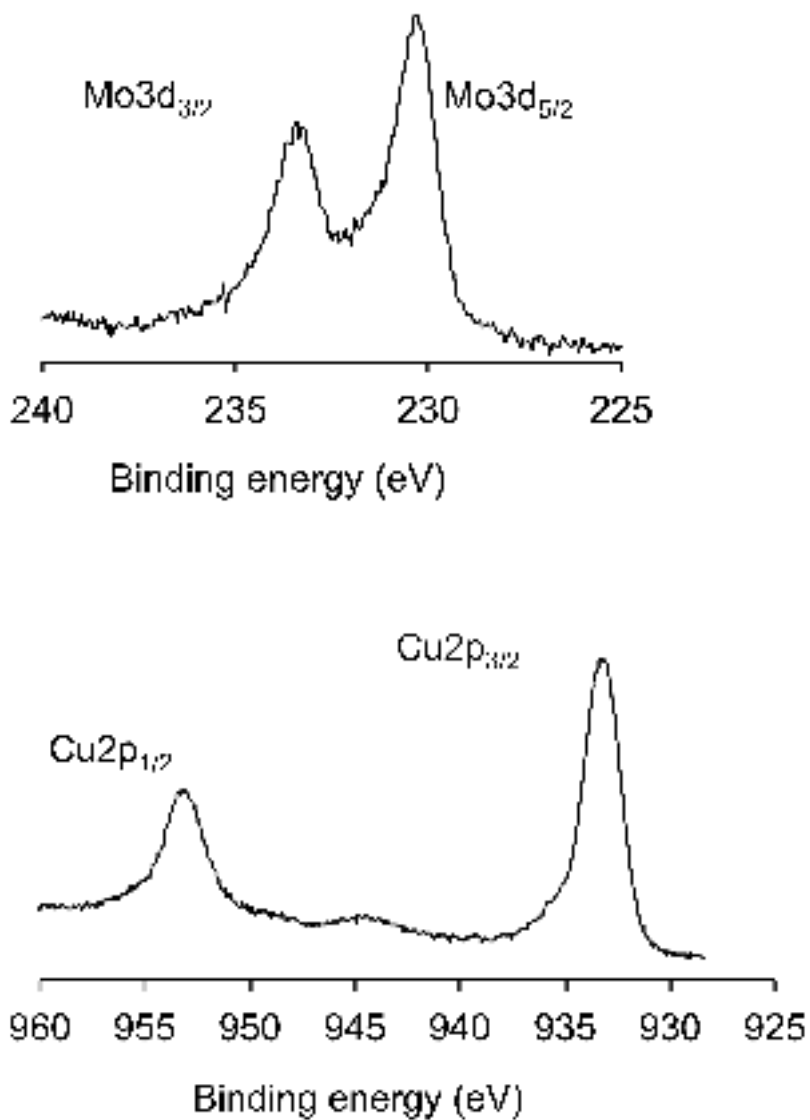


Table S1. XPS energies after the SGS of the CuMo network on different surfaces.

	Mo3d _{3/2}	Mo3d _{5/2}	Cu2p _{1/2}	Cu2p _{3/2}
<i>Cu6</i> Functionalized Silicon	233.9 eV	229.8 eV	952.6 eV	932.6 eV
<i>Cu6</i> Bare Platinum	233.7 eV	229.9 eV	952.4 eV	932.4 eV
<i>Cu3</i> Platinum dots	233.9 eV	230.2 eV	953.0 eV	932.9 eV

1- I. Horcas, R. Fernandez, J. M. Gomez-Rodriguez, J. Colchero, J. Gomez-Herrero and A. M. Baro, *Rev. Sci. Instrum.*, 2007, **78**, 013705.