

## 1D Double Wires and 2D Mobile grids:

### Co/Bipyridine coordination networks at the solid/liquid interface

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Series of molecules with bipyridine terminal unit bearing a central bridge (bpy-X-bpy) can adapt a cis-to-trans isomerization which can generate various self-assembled architectures and have been successfully observed by Scanning Tunneling Microscopy (STM) at the solid/liquid interface <sup>1, 2</sup>. Introduction of Co<sup>2+</sup> ions on these assemblies generates an in situ chemical reaction between the terminal bipyridine groups from the ditopic ligands and Co<sup>2+</sup> ions. Large monodomains of 1D double wires are formed by Co<sup>2+</sup>/ligand coordination, with polymer lengths of more than 150 nm. The polymers are organized in parallel 8 nm apart, the voids between two wires being occupied by solvent molecules. Non-linear two dimensional (2D) grids, showing high surface mobility, co-exist with the wires. The wires are formed from linear chain motifs where each cobalt center is bonded to two bipyridines. 2D grids are generated from a bifurcation motif where one cobalt bonds to three bipyridines. Surface reconstruction of the grids and of the 1D wires were observed under the STM tip. Analysis of these movements strongly indicates surface reaction at the solid liquid environments <sup>3</sup>.

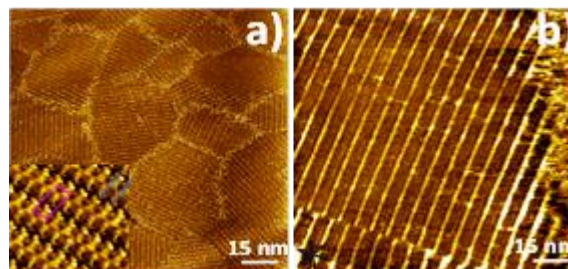


Figure 1 – STM images showing the evolution from bpy-X-bpy self-assemblies to Co-bipyridine coordination polymers.

#### Références :

- [1] X. Sun, D. Frath, F. Lafolet, J. C. Lacroix (2018) "Supramolecular Networks and Wires Dominated by Intermolecular BIEDOT Interactions", *J. Phys. Chem. C* 122, 22760–22766.
- [2] X. Sun, F. Lafolet, G. Lemerrier, F. Maurel, J. C. Lacroix (2017) "Molecular Isomerization and Multiscale Phase Transitions of a Ditopic Ligand on a Surface", *J. Phys. Chem. C* 121, 20925–20930.
- [3] X. Sun, X. L.Yao, D. Frath, F. Lafolet, G. Lemerrier, J. C. Lacroix (2019) "1D Double Wires and 2D Mobile grids:Co/Bipyridine coordination networks at the solid/liquid interface" *Just accepted to JPCL*