

# 2D-organizational Chirality: Metallosupramolecular Rhomboids

## Second-order Templatation through Cu(100)-c(2x-2)-Cl surfaces

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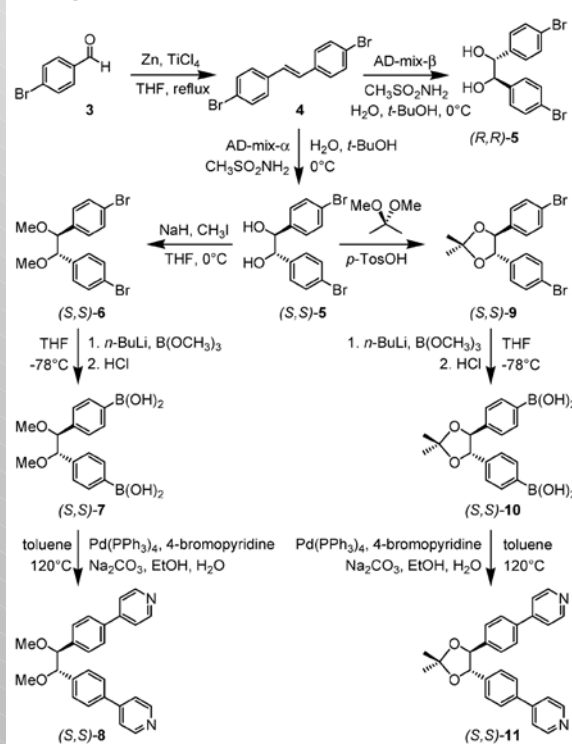
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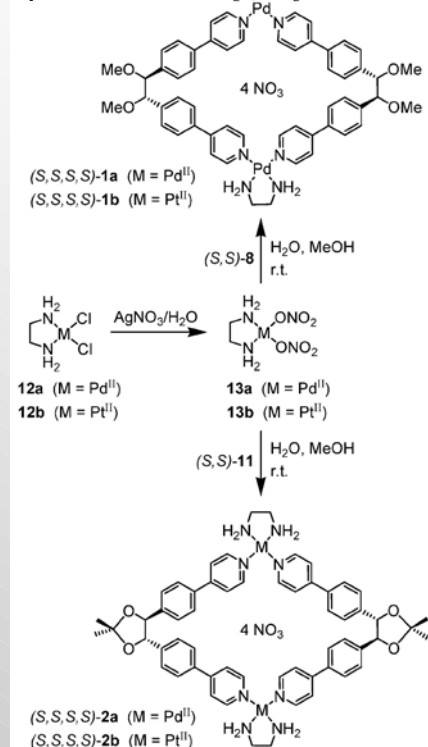
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### I. Synthesis

#### a) Ligands

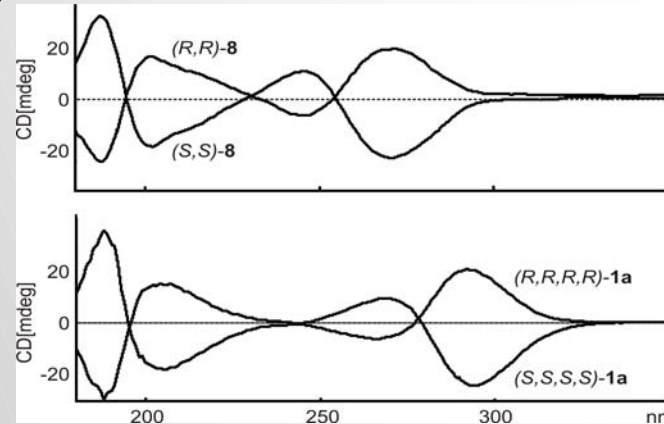


#### b) Rhomboids

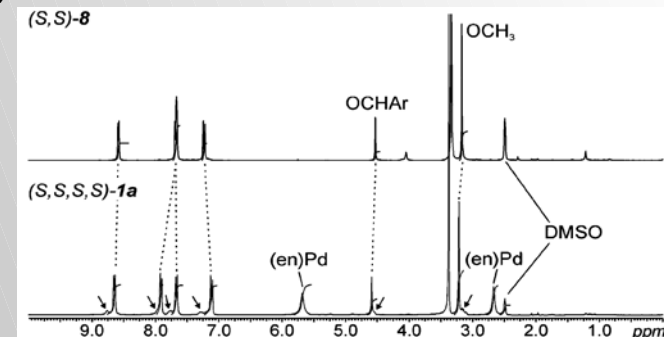


### II. Characterization

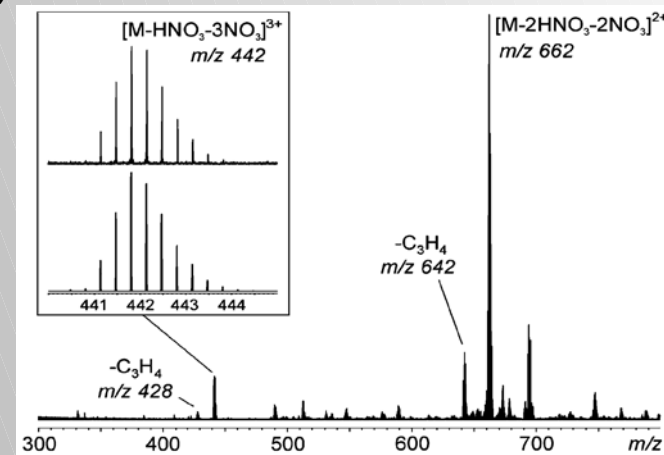
#### a) CD



#### b) NMR



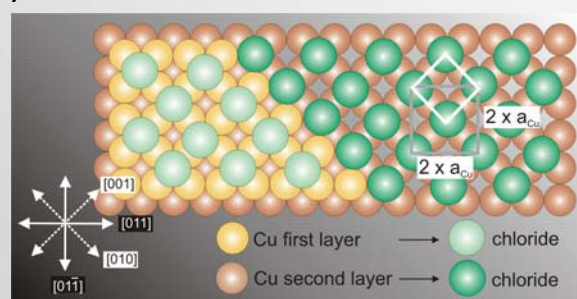
#### c) ESI FT-ICR MS



right: Experimental isotope pattern of the doubly charged ion [2b-HNO<sub>3</sub>-3NO<sub>3</sub>]<sup>2+</sup> (top). The simulated isotope pattern (bottom) of [2b-HNO<sub>3</sub>-3NO<sub>3</sub>]<sup>2+</sup> (filled lines) is superimposed with a ca. 10% contribution of a triply charged 3:3 complex (open lines).

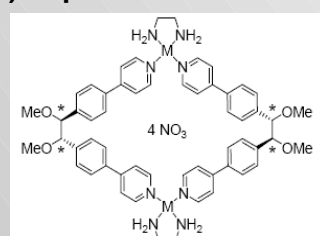
### III. EC-STM Experiments

#### a) Structure of the Electrochemical Double Layer



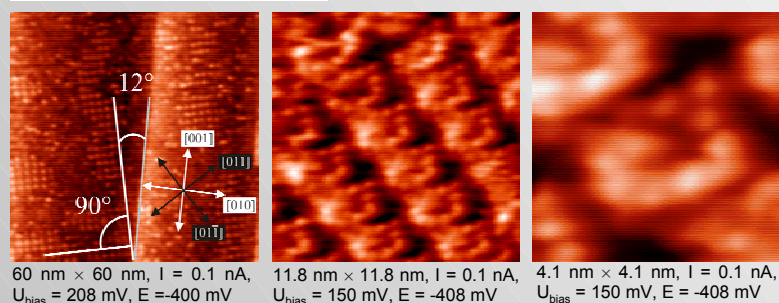
Cu first layer → chloride  
Cu second layer → chloride

#### b) Deposition of Rhomboids on Chloride Adlayer

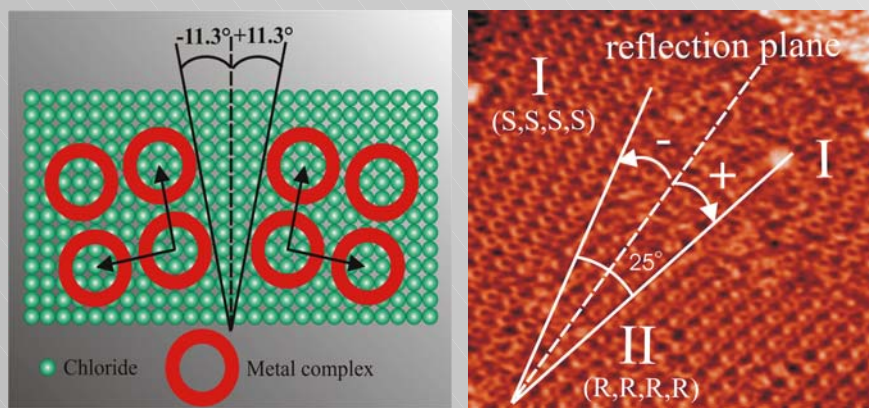
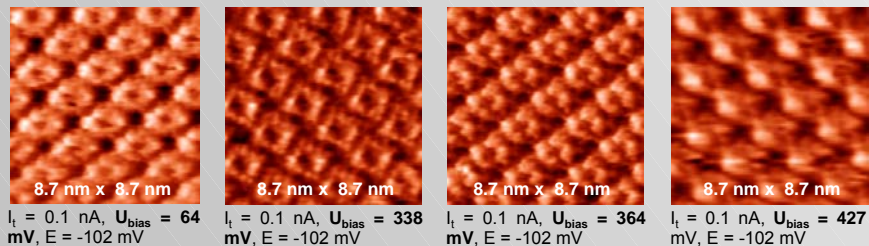


After addition of (S,S,S,S)-1b to the supporting electrolyte, ordered domains of the supramolecular rhomboids are formed on the chloride layer as second-order template. An angle of -12° ± 1° between the lattice cell vector of the metal-organic adlayer and the substrate <100> directions can be detected.

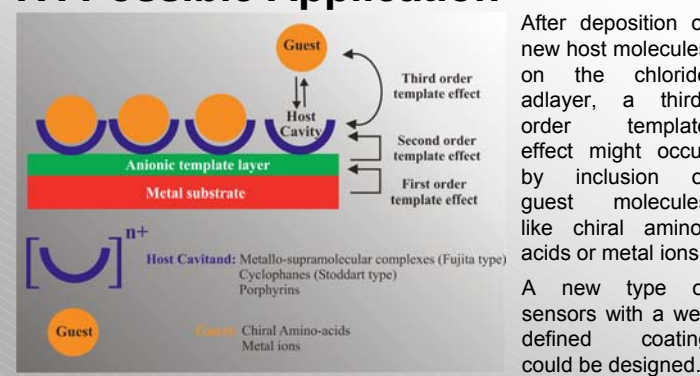
Within the ordered domains, a submolecular resolution can be achieved.



A change in the STM contrast can be achieved by a change of the tunneling conditions:



### IV. Possible Application



#### Acknowledgement

We are grateful to the Deutsche Forschungsgemeinschaft (DFG), in particular the Sonderforschungsbereich 624, and the Fonds der Chemischen Industrie (FCI) for funding. C.A.S. acknowledges a Heisenberg fellowship of the DFG; C.A.S. and M.R. thank the FCI for Dozentenstipendien. N.J. thanks the KOSEF (Grant No. R02-2002-000-00128-0 of the Basic Research Program), the CMDS, and Korea University for the financial support. S.Y.K., K.S.J. and U.S.S. are grateful for the B.K.21 fellowship. N.J. also thanks Prof. Dr. Karl Heinz Dötz and the DFG for the opportunity to visit the University of Bonn.