Poster

MOLECULAR CONTACTS THROUGH INDUCING SURFACE INITIATED POLYMERIZATION OF NANOWIRES ON MOLYBDENUM CARBIDE

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The ability to develop new methods to enhance electrical contact between organic molecules and electrodes is fundamental to the design of devices that require electron flow between an organic and a metallic component. Examples of such devices are organic thin film field effect transistors, where electrons flow from the source to drain electrodes through the organic film. The metal-organic contacts are the 'electrical plugs' in such a system. Metal-organic contacts using double or triple bonds is a promising approach in that they combine four advantages. They display very high transmission coeficients; [1,2] high thermal stability;[3,9-10] well defined contact geometries, and they show activity for olefin-metathesis add-on chemistry[1].

The dissociative adsorption of carbonyl compounds leads to the formation of C=Mo double bonds on the surface of molybdenum carbide[3-6]. These metal alkylidenes are mimics of well defined homogeneous metathesis catalysts, and present similar activity for transalkylidenation and ring-openining polymerization (ROMP)[8] reactions (figure 1). The data to be presented will emphasize surface initiated metathesis polymerization with the objective of growing conjugated molecular wires from the surface of a conducting material. from sites. In particular, results will be presented for the initial steps in the growth of polyaceylene from the surface of molybdenum carbide.

This study of surface olefin-metathesis opens a new method to interconnect electrodes in nanodevices, using molecular wires with great control and precission. Self-assembly of conjugated polymers may allow their targeted insertion into electronic and electrooptical devices.

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Figures:

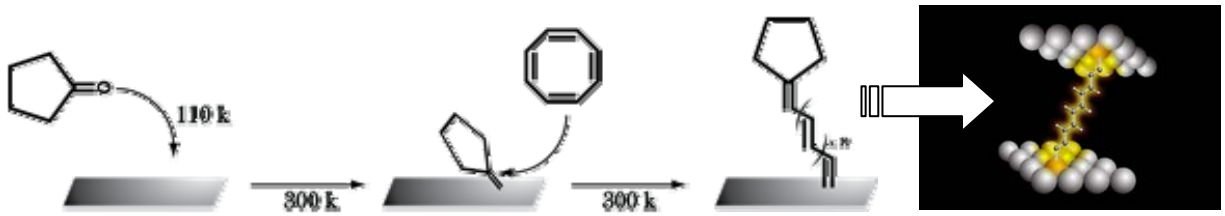

Figure 1: Schema of polyacetylene formation on molybdenum carbide and a representation of how it would be interconected between two electrodes.