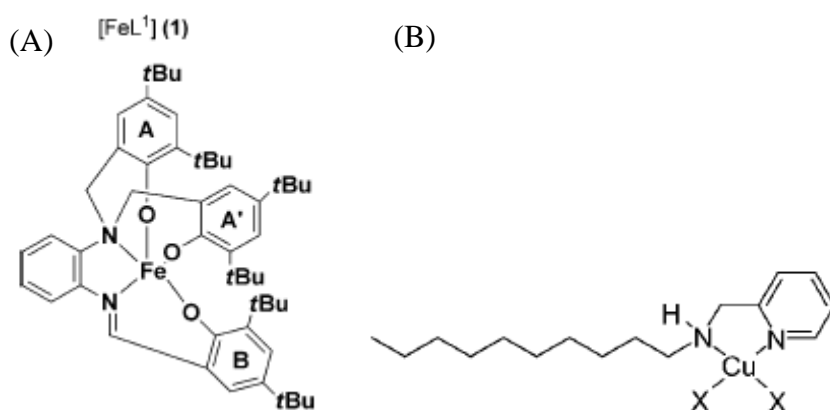


Masterarbeit

Langmuir-Blodgett monolayers of redox-active metal complexes: in situ spectroelectrochemical study

Considerable effort has been directed towards the integration of biomimetic properties into molecular materials that have customized and controllable properties. Organized films of amphiphilic molecules are important components of various devices such as molecular diodes, chips or sensors. Electron transfer in such organized supramolecular assemblies provides to the system enormous application possibilities. Coordination complexes that merge transition-metal ions with ligands that stabilize organic molecules are promising candidates for redox responsible switching processes. In this work electrochemical and spectroscopic properties of Langmuir-Blodgett monolayers of two amphiphilic metal-ion complexes: five-coordinate Fe(III) complex (Fig. 1A) and Cu(II) N-pyridine-2-ylmethyl)alkyl-1amine complex (Fig.2) will be investigated.



First, the monolayers of these complexes will be prepared at the air-water interface and transferred onto the Au electrode surface. Electrochemical properties: the capacitance of the Au electrode and the current due to metal centre oxidation in the LB films will be studied. Next, the LB film will be in situ investigated by means of the polarization modulation infrared absorption-reflection spectroscopy (PM IRRAS). The IR spectra of the film at various potentials applied the electrode will be measured. The analysis of IR bands position and intensity will provide the structural changes in the film induced by the electron transfer reaction. The knowledge of these changes is highly required for technological applications.

This project is realized in cooperation with Prof. Dr. Claudio Verani at the Wayne State University, Detroit, USA.

Betreuung: Dr. Izabella Brand