

FINAL MASTER PROJECT PROPOSAL



Title

Fabrication and applications of MOP ultrathin films obtained by the Langmuir-Blodgett (LB) method

Supervisor(s)

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Summary of the project

Metal organic polyhedra (MOP) are individual porous molecular cages that do not form extended frameworks like MOFs, but crystalize in the solid state by aggregation of individual molecules. When these crystals are dissolved, single intact MOP molecules may be present in solution since no bonds would be broken.

The robustness, permanent porosity, tunable cavity size, thermal and chemical stability of these discrete structures are the basis for a great variety of applications, including bio-medicine, catalysis, molecular sensing, gas adsorption and separation.

The main objective of this final master project is the fabrication of MOP ultrathin films with the desired film thickness and molecular organization using the Langmuir-Blodgett (LB) method.

LB films will be characterized using UV-vis and IR spectroscopies, atomic force microscopy, quartz crystal microbalance (QCM) and electron microscopy in order to optimize the film fabrication procedure. Moreover, the adsorption/desorption of different adsorbents of the porous films will be done using a device based on the QCM.

These studies will allow evaluating the potential applications of MOP ultrathin films in the development of chemical sensors and separation membranes based on these compounds.