Soutenance de thèse

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Self Assembly of Dithiol Molecules and Adsorption of Chalcogen Atoms on Metals

In this thesis, the characteristics of SAMs of dithiol molecules adsorption on metals are investigated by synchrotron photoemission studies, ion scattering, and LEED. The aim is to characterize self-assembled dithiol monolayers formed by evaporative assembly, to understand the transition of dithiols from a lying down phase to standing up phase, and eventually existence of rearrangement and dissociation processes. Also the interaction between chalcogen atoms (S and Se) and some metals was investigated in relation to the self assembly work.

The result of Se atoms adsorption on Au surface shows Se8 features, while for Ag the silver selenide is formed. S atoms adsorption on Cu(111), Cu(100) and S and Se on Pd(111) surfaces result in metal sulfidation and selenisation and some interesting ordered structures were observed. On Au(111) a lying down phase of butanedithiol (C4DT) could be substituted by octanethiols to form a mixed standing up phase, and also a standing-up C4DT thiol terminated phase could be formed upon exposure to C4DT vapors. This shows that the lying down phase should not impede formation of the standing up one. The adsorption of 1,4-benzenedimethanethiol (BDMT) on Au(111), Ag(111), Au(110), Cu(111), Cu(100) and BDMT and dodecanethiol on Pd(111) was investigated. The standing up thiol terminated phase could be formed in some cases, when the surface is not very reactive. In case of Cu and Pd initial dissociation of some thiols occurs and surface sulphide was formed on Pd. Thiol adsorption then proceeds on these sulphidised surfaces. Thiol adsorption on preprepared sulfidised and selenised surfaces was performed and indicates changes at the interface due to thiol adsorption. The detailed information about their adsorption characteristics should help in resolving ambiguities in characterization of thiol and sulphide assemblies.

Attention ! Jour et heure inhabituels

Vendredi 4 juillet 2014 à 14h00

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La soutenance sera suivie d'un pot auquel vous êtes chaleureusement conviés.