Séminaire - Pr Ernst Sudhölter

Mercredi 17 octobre 2018, 16h - Amphi IPREM

Le 17 octobre 2018

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Titre: "Porous organic frameworks containing platinum nanoparticles for silicon nanowire based chemical sensing"

Abstract

Porous organic frameworks (POFs) have been discovered recently, and are promising new materials for molecular separations, chemical sensing and catalysis. In this study we show the successful development of a chemical sensor, which is based on the covalent immobilisation of melamine-terephthaldehyde POFs on amino propyl modified silicon nanowires (SiNW). These nanowires were made by top down photo-lithography and act as a (nano-sized) field effect transistor (FET). Changes in the chemical composition of the immobilised POF (the selector layer) is directly monitored by the FET (the transducer) as a change of source-drain current or as a change of gate potential.

The POFs on top of the SiNW was post-synthesis functionalised by uniformly distributed platinum nanoparticles (PtNP) through impregnation using chloroplatinic acid, followed by in situ sodium boron hydride reduction. The obtained PtNP@POF-SiNW chemical sensor showed enhanced sensitivity for methanol vapor detection.

mots-clés*:*chemical sensors, photo-lithography, organic electronics