Nanowire sensors for chemical and biological detection

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Nanowires as (Bio)Sensors

The conversion of a silicon nanowire (NW) field effect transistor into a chemical sensor is done by covalent immobilization of receptor molecules, which selectively interact with the specific target objects to be recognized.

We have established functionalization protocols for different metal oxides surfaces and we demonstrate the successful introduction of various functionalities. Our modified surfaces exhibit features which are important for sensor design.

Formation of Functional Monolayers

Inert layers:
alkane silane layers
perfluorosilanes
OEG / PEG

Biosensing applications:
sugar-lectin binding assays

pH sensors:
charged functional groups

Ion selective sensors
(crown ethers)

Protein ligands