

Semester project, Bachelor Thesis, Master Thesis

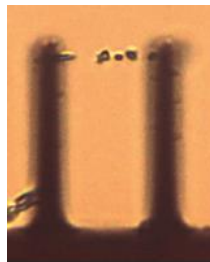
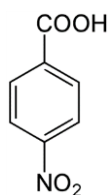
Optical visualization of Single Walled Carbon Nanotubes

Motivation

Modern time requests small sized sensors with low energy consumption, high sensitivity and selectivity to specific stimuli. These requirements could be fulfilled with utilization of 1D materials for example individual Single Walled Carbon Nanotubes (SWNTs). To determine the nanotube localization prior their integration into sensors is a challenge soluble for example by temporal deposition of optically detectable particles on SWNTs.

Goal

This project will focus on investigation and optimization of deposition and evaporation of specific material (for example pNBA = p-nitrobenzoic acid) forming submicroscopic particles on as-grown SWNTs. This quick and nondestructive approach should deliver maximum yield of detectable CNTs.



*Schematic illustration of chemical structure of pNBA molecule and the optical image of decorated suspended SWNT synthesized between Si structures.
(Courtesy: K. K. Studer, MNS ETH)*

Learning Opportunities

Become familiar with SWNTs and CNFET devices, their fabrication and characterization. Use state-of-the-art characterization methods and equipment.

Work Description

1. Characterization of SWNT and CNFETs
2. Investigation of the effect of the deposit thickness, deposition and evaporation temperature, different nanoparticle types onto nanotube and CNFET properties.
3. Investigation of reproducibility of particle deposition and the yield of detectable CNTs
4. Writing and defending a scientific report

Your profile

You are a student of micro-process engineering, mechanical engineering, material science, physics or chemistry with an interest in carbon nanotubes, sensors and nanotechnology. You should be able to work independently in an organized manner. Creativity, responsibility, eagerness to learn, self-motivation, persistence, and enjoying working in laboratory and with technical equipment are desired personal qualities.

Contact

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