Title: Contacting nanostructures for sensor measurements

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Abstract: The bachelor thesis is dealing with contacting nanostructures using electron beam lithography (EBL). Work was carried out in a scanning electron microscope on a mica dielectric substrate with WO_x nanorods on the surface in order to prepare a sensor for the detection of H_2. In this experiment, parameters for individual sub-processes of EBL were modified. Optimal thicknesses of the PMMA resist 120K (5% anisole) and PMMA 996K (1% anisole) were selected to prepare multilayer resist for an EBL mask. On the resulting bilayer resist electron beam exposure doses were optimized. The appropriate dose was selected and used for creating a matrix designed to contact the WO_x nanorods supported on mica. To contact the nanostructures, macrocontacts were deposited on the surface of mica at first, and then the EBL process ran. The result was a conductive connection of the tungsten oxide nanorods by created nanocontacts with macrocontacts. Sensoric properties of the sensor in this way contacted were subsequently successfully tested with H_2.

Keywords: Sensor, WO_x nanorods, Electron beam lithografhy