

Workshop on Scanning Probe Nanotechnology

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Nanolithography in amorphous carbon layers

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Abstract

There are a lot of possibilities to use scanning probe microscopes for lithography in the nanometer range, for instance the patterning of Si or Ti by anodic oxidation in the scanning force microscope. In this talk, we demonstrate the local electron-induced oxidation of amorphous carbon (a-C) using scanning probe microscopes. In contrast to processes with solid oxides as reaction products it is possible to produce three-dimensional patterns.

We compare the AFM to the STM approach and discuss the microscopic mechanism of the a-C patterning process. Scanning probe based methods are slow due to their serial character. We present the successful extension of the a-C nanolithography towards a much faster parallel patterning procedure using prepatterned conducting structures. Finally, applications of this new patterning method will be mentioned.

References:

Thomas Mühl, Johannes Kretz, Ingolf Mönch, Claus M. Schneider, Hubert Brückl, and Günter Reiss, Appl. Phys. Lett. 76, 786 (2000).