

Deposition and Modification of Nanowires by FluidFM technology

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The FluidFM [1] combines AFM technology with nanofluidics. A channel incorporated directly in the cantilever and an aperture at the apex of the tip allows local liquid dispensing of soluble molecules in air and in liquid. Therefore, the FluidFM is the adapted tool for local chemistry with high resolution. Especially for synthesis and modification of nanowires, it provides new opportunities.

Nanowires have attracted great interest in biological sensing research. The high contact area between analyst and nanowire leads to a high sensitivity. A novel protocol for local synthesis and functionalization by FluidFM technology is presented thanks to the opportunity of filling the microchannel with specific soluble molecules. Both, metal and conductive polymer nanowires can be deposited in liquid and at desired position of the substrate. Because of the dimension of the aperture at the apex of the tip, the FluidFM can later be used for individual functionalization of closely packed nanowires with specific receptor molecules.

Additionally, the FluidFM can be used as an electrochemical lithographic tool. A non-conducting organic coating can be locally electrografted on a conducting substrate by incorporation of a counter electrode into the connected fluidic circuit and applying a potential between counter electrode and conducting substrate.

Acknowledgements

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References

[1] A. Meister, M. Gabi, P. Behr, P. Studer, J. Vörös, P. Niedermann, J. Bitterli, J. Polesel-Maris, M. Liley, H. Heinzelmann, T. Zambelli, *Nano Letters* **9** (2009) 2501.

Figures

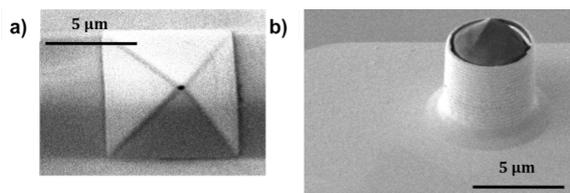


Figure 1: Different geometries of microchanneled cantilever tips. **a)** Pyramidal tip with an aperture of 200 nm at the apex. **b)** Cylindrical tip with embedded pyramid for high-resolution scanning.

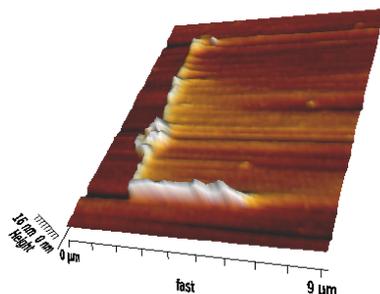


Figure 2: Deposition (in air) of Au-colloids (5nm) onto a PEI-coated Si-wafer.