

Projects at the COMLAB facilities and EPFL Center of
MicroNanoTechnology

**HOLLOW ATOMIC FORCE MICROSCOPY CANTILEVERED
PROBE ARRAYS FOR NANOSCALE DISPENSING OF LIQUIDS**

Joanna Przybylska, André Meister, Philippe Niedermann, Martha Liley and Harry Heinzlmann

CSEM Centre Suisse d'Electronique et de Microtechnique SA, Rue Jaquet-Droz 1, CH-2002 Neuchâtel, Switzerland, e-mail:andre.meister@csem.ch

Project objective:

This work reports on the top-down fabrication and the applications of new atomic force microscopy (AFM) probes dedicated to the on-demand dispensing of individual nanodroplets. The hollowness of the cantilever is used as a microfluidic channel that connects the reservoir located in the chip to the hollow tip. Focused ion beam (FIB) milling was used to open an aperture at the tip apex in order to permit the transfer of liquid towards the sample.

The microfabrication of cantilevers with closed microfluidic channels relies on the fusion bonding and thermal oxidation of two pre-structured silicon wafers.

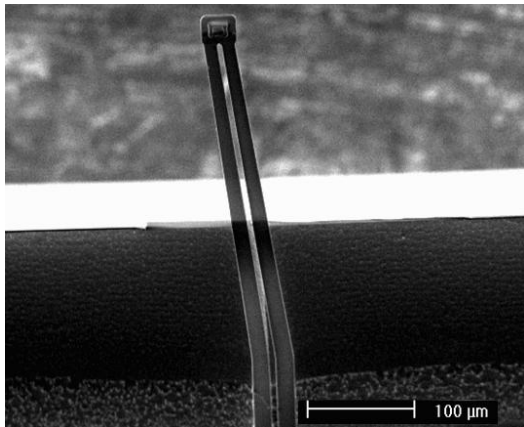


Figure 1: SEM image of the cantilever used for nanodispensing.

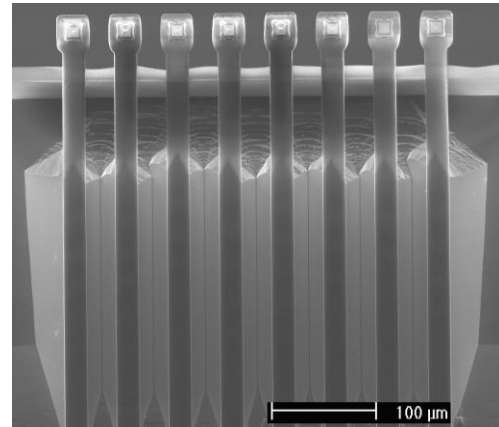


Figure 2: SEM image of an array of cantilevers.

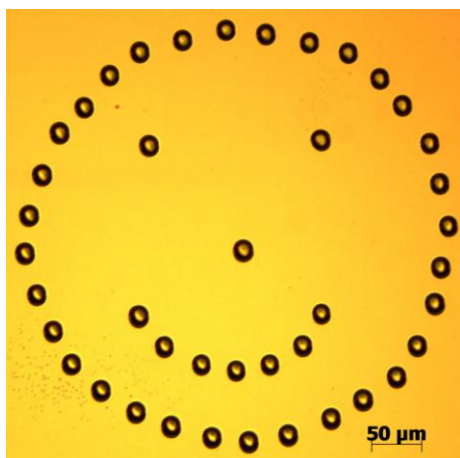


Figure 3: Optical image of an array of glycerol droplets dispensed with single cantilever chip.

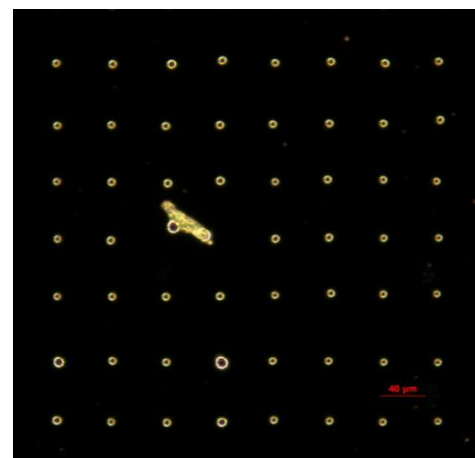


Figure 4: Optical images of an array of glycerol droplets dispensed with array of cantilevers.

Techniques employed: Thermal fusion bonding, KOH etching, FIB, SEM.

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