

Microchannel and microreservoir manufacturing by inkjet printing and AFM-nanolithography techniques

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Devices for point of care (POC) applications of analytical diagnostics might in the future be developed by printing techniques. Typically, structures of microchannels and microreservoir arrays will be needed for the chemical analysis and to host functionalised nanoparticles for probing. Here, we present a comparative study of the fabrication of microchannels and microreservoirs on glass and polymer surfaces using two techniques, i.e. inkjet printing and engraving techniques, e.g. AFM-nanolithography. The dimensions of the structures have been characterized by optical microscopy and atomic force microscopy (AFM). Furthermore, the surface roughness has been investigated. Using printing and engraving techniques with different parameters and on different materials, channel widths and reservoir diameters have been varied in the range from tens of nanometers to hundreds of micrometers and are compared to channels obtained by similar engraving techniques [1]. Inkjet microdosing of nanoparticles with fluorescent markers has been performed in the microreservoir arrays and was studied with fluorescent microscopy.

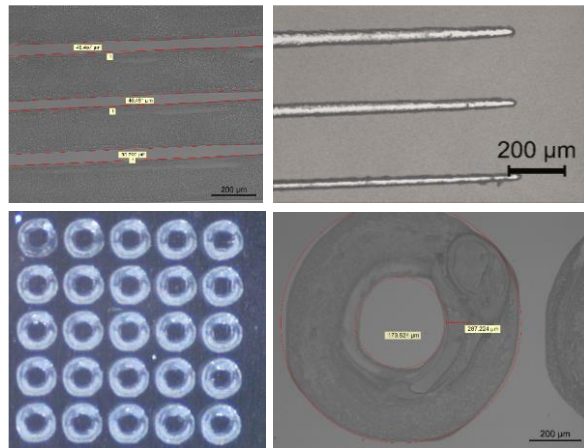


Fig.1 Example of microchannels and microreservoir arrays obtained by inkjet printing and engraving techniques.

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References

[1] Jaephil Do, Jane Y.Zhang, and Cathreine M. Klapperich, Robotics and Computer-Integrated Manufacturing 27, 245-248 (2011).