

Séminaire SOLEIL

"What kind of microfluidics for synchrotron facilities ?"

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Invité par Paul DUMAS

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Séminaires

The microfluidics is the science and technology of systems that process or manipulate small amounts of fluids, using channels with dimensions of tens to hundreds of micrometers. Since a decade microfluidics is become a powerful tool for fundamental and applied researches. Microfluidics influence subject areas from chemical synthesis and biological analysis to optics and information technology. In the field of analysis the microfluidics has undoubtedly offered number of useful capabilities: small quantities of samples and reagents, separation and detection with high resolution and sensitivity, low cost, short times for analysis [1]. The small size combined to laminar flow (intrinsic characteristic) offer fundamentally new capabilities in the control of concentrations of molecules in space and time.

At the early stage of its development the microfluidics has benefited of two particularly important contributions which have boosted it: *i-* the development of soft lithography in PDMS as a method for fabricating prototype devices [2] *ii-* the development of simple method of fabricating pneumatically activated valves, mixers and pumps on the basis of soft lithographic procedures [3]. In this presentation I will start with a non-exhaustive state of the art where I will present, among others things, the main fabrication steps of the popular soft lithography in PDMS polymer. I will illustrate this with two practical experiments performed in the laboratory relating to Pickering emulsion and liquid/liquid extraction.

In the second part I will refocus on microfluidics and synchrotron applications. We will see that for synchrotron radiation there is a need of dedicated materials and technics (standard microfabrication materials are not appropriate). I will illustrate this with laboratory experiments.

[1] Manz, A *et al.* "Planar chips technology for miniaturization and integration of separation techniques into monitoring systems- capillary electrophoresis on chip". *J. Chromatog.*, **593**, 253-258 (1992).

[2] McDonald, J.C. *et al.* "Fabrication of microfluidic systems in poly(dimethylsiloxane)". *Electrophoresis*, **21**, 27-40 (2000).

[3] Thorsen, T. *et al.* "Microfluidic large-scale integration", *Science*, **298**, 580-584 (2002).



Ce séminaire sera suivi d'une pause-café



Formalités d'entrée : accès libre dans l'amphi du Pavillon d'Accueil. Si la manifestation a lieu dans le Grand Amphi Soleil du Bâtiment Central, merci de vous munir d'une pièce d'identité (à échanger à l'accueil contre un badge d'accès).

SYNCHROTRON SOLEIL

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