

Abstract Submitted  
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**Controlling PDMS surfaces properties in microfluidic systems: a way to control multiphase flows** HERVÉ WILLAIME, VALESSA BARBIER, POL GRASLAND-MONGRAIN, YVES HENNEQUIN, NICOLAS PANNACCI, PATRICK TABELING, UMR cnrs Gulliver 7083 , MICHAEL TATOULIAN, UPRES 287, ENSCP Paris — PDMS is a popular material, well adapted for the rapid fabrication of microfluidic systems. Its disadvantages are known: one of them is an inability to offer reliable and convenient-to-control surface properties. For multiphase flows, this induces limitations on the type of emulsions we may produce, since the external phase must in all cases fully wet the channels walls. In this paper we propose different methods for coating PDMS surfaces to make the surface hydrophilic. We propose 2 different methods to polymerize acrylic acid on PDMS: the first is a coating by plasma (dry) and the second is an in situ coating (first proposed by Eugenia Kumacheva's group) by flowing a solution of acrylic acid and benzophenon as UV photoinitiator. Both methods permit a localized coating, and it is so possible to pattern PDMS surfaces by alternating hydrophilic and hydrophobic surfaces. We will show examples of applications obtained in textured microchannels.

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