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Nanofluidics: Ionic transport through a nanochannel[1] ALESSANDRO
SIRIA, LPMCN-Lyon, ANNE-LAURE BIANCE, LPMCN - Lyon, CRISTOPHE YBERT, LYDERIC BOCQUET, LPMCN-Lyon, LIQUID@INTERFACES TEAM
— Nanopore based membranes find nowadays interesting applications such as water treatment [1] and power energy conversion [2]. We consider a single micrometric glass channel. We show how surface effect can modify the channel trasport properties. We measure the ionic conductance through the channel as a function of the electrolyte concentration showing a saturation effect in the very low concentration regime. Such effect is due to the surface correction to the channel conductance [3]. The effective surface charge obtained by the conductance measurements, is largely higher than what commonly measured for glass surfaces [4]. Introducing a moderate hydrodynamic slippage of the fluid at the solid-fluid interface allows us to obtain surface charge values in agreement with what presented in literature. A quantitave agreement with independent measurement of electro-osmotic mobility and streaming current allows us to fully characterize the slippage effect on the channel electokinetic properties.

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[2] F.H.J. van der Heyden et al. Nanoletters 7, 4, 1022 (2007)
[3] D. Stein et al. Phys. Rev. Lett. 93, 3, 035901 (2004)
[4] L. Bocquet et al. Chem Soc, Rev. (2010)

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Alessandro Siria
LPMCN-Lyon

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