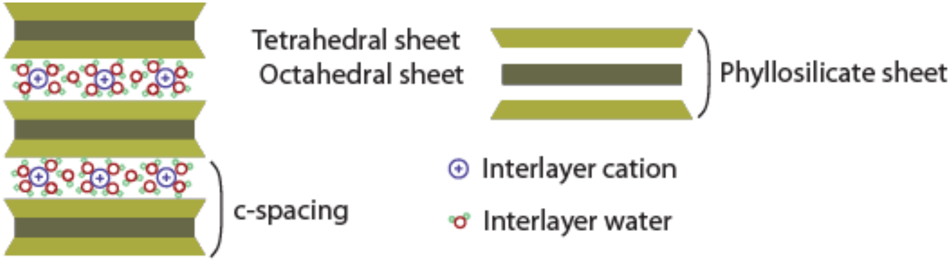
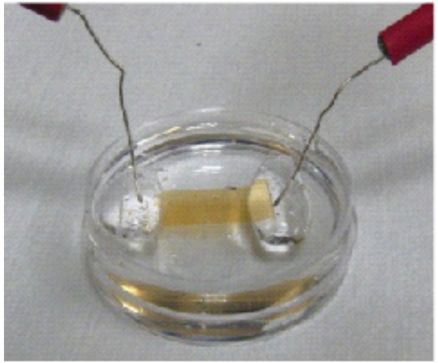
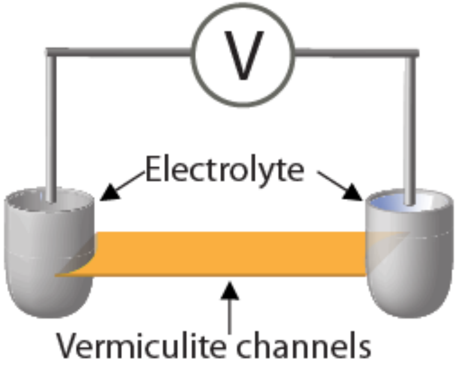
Clay-based 2D Nanofluidic Proton Channels

J-J. Shao, K. Raidongia, A.R. Koltonow, JX. Huang
Department of Materials Science and Engineering, Northwestern University

Nanofluidic devices offer unusual ways to control the flows of ions, and can be used to construct new sorts of ionic circuits. However, the high price and low yielding of fabrication may be a barrier to application of nanofluidics. Work recently published by the Huang group demonstrates how a nanofluidic proton-conducting membrane can be made from vermiculite, a cheap mineral. Protons can be quickly shuttled between water molecules in the nanometer-sized spaces between vermiculite layers. Clay based 2D channels show extraordinary thermal stability, and remain functional after annealing at 500 °C.







Materials Research Center
Northwestern University

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