

Abstract Submitted  
for the DFD08 Meeting of  
The American Physical Society

**Osmotically driven flows in microchannels separated by a semipermeable membrane** HENRIK BRUUS, KAARE HARTVIG JENSEN, TOMAS BOHR, Center for Fluid Dynamics, Technical University of Denmark — Osmotically driven flows in microchannels are studied experimentally and theoretically. The propagation of the front of sugar solutions has been measured using dye and particle tracking in 200  $\mu\text{m}$  wide and 50, 100, and 200  $\mu\text{m}$  high polymer-based microchannels. Each of these microchannels was separated by a semipermeable membrane from a reservoir containing pure water. We have also established a theoretical model of this system. In the limit of low axial flow resistance, our model predicts the propagation speed of the sugar front as a function of sugar concentration and channel geometry. The theoretical predictions agree well with the measurements. Our motivations for studying osmotically driven flows are that they are believed to be responsible for the translocation of sugar in plants and that they can be used as the driving mechanism in micropumps with no moveable parts.

This work was supported by the Danish National Research Foundation, Grant No. 74.

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Date submitted: 04 Aug 2008

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