

Abstract Submitted
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Diffusion-limited evaporation in microchannels¹ ADAM HOFFMAN, KENNETH BREUER, Brown University — We present measurements regarding the evaporation of a liquid from long microchannels. The channels are approximately 9000 microns long, 100 and 500 microns wide and range in depth from 1 to 22 microns. Both ends are open to the atmosphere. The evaporation of the liquid slug within the channel is measured by optically tracking the recession of the menisci from both ends. Different fluids are tested as well as different surface treatments, and the results are modeled in the context of a simple theory based on the diffusion of the vapor along the long channel. At these scales, the shape of the meniscus and its wetting behavior is shown to have a strong effect on the overall evaporation rates, and we hypothesize that this is due to the role of the transition and absorbed films that precede the visible meniscus.

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