Abstract Submitted
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Sorption Isotherms in Networked Nanoporous Media: Do the Parts Equal the Whole?[1] CASEY E. CHIANG, FELIX CASANOVA, ANNE M. RUMINSKI, MICHAEL J. SAILOR, IVAN K. SCHULLER, University of California-San Diego — Sorption isotherms are a very important tool in the characterization of nanoporous materials. However, there is still controversy as to how capillary condensation and evaporation transitions along the isotherm correlate with the pore morphology (shape) and topology (within a network). We combined narrow (<10 nm) and wide (>30 nm) pores in nanoporous silicon to tailor the simplest networks: narrow above wide (ink-bottle) and vice versa (funnel). In addition, we compared these against their single-layered constituents. From sorption isotherms measured by optical interferometry, we observe that capillary **condensation** occurs identically in all pores with direct access to the gas reservoir and slightly delayed (delayed adsorption) when access is blocked, while capillary **evaporation** occurs identically in all pores with direct access to the gas reservoir and is delayed (pore-blocking) until direct access is allowed otherwise. These experimental results allow us to understand the global capillary behavior in nanoporous silicon.

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