Abstract Submitted
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**Fabrication and flow characterization of vertically aligned carbon-nanotube/polymer membranes**[1] RICHARD CASTELLANO, Rutgers Univ, ERIC MESHOT, FRANCESCO FORNASIERO, Lawrence Livermore National Labs, JERRY SHAN, Rutgers Univ — Membranes with well-controlled nanopores are of interest for applications as diverse as chemical separations, water purification, and "green" power generation. In particular, membranes incorporating carbon nanotubes (CNTs) as through-pores have been shown to pass fluids at rates orders-of-magnitude faster than predicted by continuum theory. However, cost-effective and scalable solutions for fabricating such membranes are still an area of research[1]. We describe a solution-based fabrication technique for creating polymer composite membranes from bulk nanotubes using electric-field alignment and electrophoretic concentration[2]. We then focus on flow characterization of membranes with single-wall nanotube (SWNT) pores. We demonstrate membrane quality by size-exclusion testing and showing that the flowrate of different gasses scales as the square root of molecular weight. The gas flowrates and moisture-vapor-transmission rates are compared with theoretical predictions and with composite membranes -fabricated from CVD-grown SWNT arrays[1].

[1] $N.Biu, E.R.Meshot, S.Kim, J.Peña, P.W.Gibson, K.J.Wu, F.Fornasiero.$
*Adv. Mat.*(2016)
[2] $R.J.Castellano, C.Akin, G.Giraldo, S.Kim, F.Fornasiero, J.W.Shan.$
*J. Applied Physics.*(2015)

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