

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Fabrication and Characterization of High Aspect Ratio Membranes and Microporous Filters made from PMMA ALEX BURANT, Dept. of Physics and Astronomy, James Madison University, Harrisonburg, VA, BRIAN AUGUSTINE, Dept. of Chemistry and Biochemistry, James Madison University, Harrisonburg, VA, CHRIS HUGHES, Dept. of Physics and Astronomy, James Madison University, Harrisonburg, VA — This experiment shows a new way to create high aspect ratio membranes and microporous filters by curing a liquid monomer, methyl methacrylate (MMA), into poly(methyl methacrylate) (PMMA) structures. Holes were cut in 200 μm PMMA sheets by laser cutting. Membranes were made by filling these holes with wax and cooling until the wax solidified. The liquid monomer solution was flowed over the wax-filled holes and photopolymerized to make a thin membrane. The membrane thickness could be controlled by adding 3-10 μm , 30-50 μm , or 50-100 μm silica beads to the monomer solution. Filters were made by filling the holes with curing solution containing 3-10 μm beads, photopolymerizing, and etching the silica with hydrofluoric acid. The filter porosity could be controlled by varying the weight percentage of silica beads added to the monomer solution. Scanning electron microscopy was used as a method for characterizing both membrane thickness and filter porosity.

Alex Burant
Dept. of Physics and Astronomy,
James Madison University, Harrisonburg, VA

Date submitted: 17 Nov 2010

Electronic form version 1.4