

Abstract Submitted
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Carbon Nanotube Templated Microfabrication of Nickel-Plated Size Exclusion Filters¹ RYAN BADGER, Brigham Young University — Carbon Nanotube Templated Microfabrication (CNT-M) is a process in which a two dimensional pattern is grown into a three dimensional structure. This method allows for high aspect ratios and good dimensional control, which are desirable qualities in nano-scale devices. CNT-M devices are often infiltrated with various materials, and in some cases it would be desirable to infiltrate CNT-M devices with metals, which are electrically conductive and catalytic for some interesting chemical reactions. Although nickel electroplating is a well-understood process, applying it to CNT growths is not. We present a method for infiltrating CNT-M structures with nickel using an electrolytic plating process. We present possible applications of this method, including a CNT-M microseive with applications in fluid and gas filtering. Using a low-stress nickel sulfamate electrolyte solution, at the proper temperature, with a pulse-plating technique, issues present in early samples were eliminated. Progress led towards a sieve with a nickel infiltrated forest, and an even nickel distribution on the surfaces of the structure. Research was focused on the development, refinement, and characterization of nickel-plated sieves produced using the method described above.

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