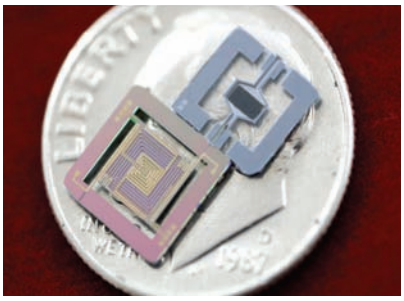
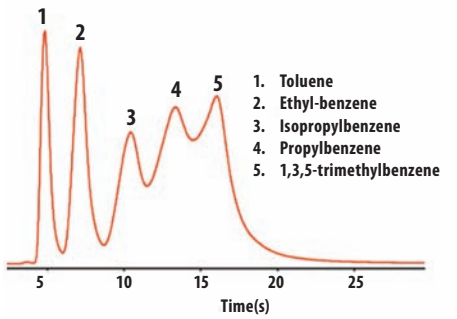
# First Separations From Released Orion MicroColumns

*Shaelah M. Reidy, Katharine Beach, Robert Gordenker, and Kensall D. Wise*



***A 10cm Orion microcolumn and single-bed CNT-loaded preconcentrator on a U.S. dime.***




***Analyte separations from a 10cm-long Orion column.***

The first Orion CVD-sealed and released microcolumns have recently been fabricated, coated, and successfully used to separate gaseous mixtures. The Orion micro gas chromatography system is being developed by the WIMS ERC to explore the scaling limits in such systems. The very low mass of these columns allows high-speed temperature programming and their high thermal isolation substantially reduces their operating power. Suspended from the chip rim by their fluidic connections, the columns are semicircular in cross section with a silicon-and-dielectric upper surface and 12$\mu$m-thick, single-crystal, silicon walls. With channels typically 90$\mu$m deep and 120$\mu$m wide, both 10cm- and 25cm-long columns have been fabricated. The overall chip areas are 50mm$^2$ and 80mm$^2$, respectively. A non-polar stationary phase was deposited by initially filling the columns with polydimethylsiloxane dissolved in a 1:1 mixture of petane:dichloromethane and subsequently vacuum drying them in place. The solution concentration determines the stationary phase thickness, which is typically about 0.1$\mu$m. A five-compound separation has been achieved in 16 seconds as shown. ■