

[Altering the polarity of self-assembled carbon nanotubes stationary phase via covalent functionalization](#)

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Abstract:

We present for the first time that self assembled carbon nanotubes (CNTs) can be functionalized to alter their polarity and chromatographic behavior. The nanotube phase was synthesized via ethanol chemical vapor deposition (CVD) and functionalized by acid oxidation. Compared to an equivalent CNT column, the functionalized nanotubes (f-CNTs) showed strong retention and enhanced separation for polar organics such as alcohols, where the capacity factor increased by more than 100%, and the number of plates per metre increased by as much as 60%. The f-CNTs phase showed classical chromatographic behavior and good reproducibility. This is an important first step toward the development of diverse functionalized CNT columns.

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