Self-Assembly of Carbon Nanotubes via Ethanol Chemical Vapor Deposition for the Synthesis of Gas Chromatography

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Source:
ANALYTICAL CHEMISTRY Volume: 82 Issue: 12 Pages: 5184-5188 DOI: 10.1021/ac100428m Published: JUN 15 2010

Abstract:
The synthesis of the gas chromatography stationary phase by molecular self-assembly of carbon nanotubes (CNTs) via a novel ethanol chemical vapor deposition process is presented. A major advantage is that ethanol was found to be an excellent carbon source that generated highly pure multiwalled carbon nanotubes with very little non-tubular carbon impurities. The nanotubes were not vertically aligned but lay flat out on the column surface in a randomly distributed configuration. The CNT phase was able to separate a wide range of organic compounds with diverse polarity and volatility, where the number of plates per meter ranged from 900 to 1280. It also showed classical chromatographic behavior and good precision.

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