Carbon nanotube based stationary phases for microchip chromatography

The objective of this article is to provide an overview and critical evaluation of the use of carbon nanotubes and related carbon-based nanomaterials for microchip chromatography. The unique properties of carbon nanotubes, such as a very high surface area and intriguing adsorptive behaviour, have already been demonstrated in more classical formats, for improved separation performance in gas and liquid chromatography, and for unique applications in solid phase extraction. Carbon nanotubes are now also entering the field of microfluidics, where there is a large potential to be able to provide integrated, tailor-made nanotube columns by means of catalytic growth of the nanotubes inside the fluidic channels. An evaluation of the different implementations of carbon nanotubes and related carbon-based nanomaterials for microfluidic chromatography devices is given in terms of separation performance and ease of fabrication.

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