

Development and current trends in using polysaccharide-based chiral selectors for separation of enantiomers in liquid-phase

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Polysaccharide derivatives represent one of the most successful group of chiral selectors for separation of enantiomers in liquid-phase techniques, such as high-performance liquid chromatography (HPLC) [1], supercritical fluid chromatography (SFC) [2], nano-liquid chromatography (nano-LC) and capillary electrochromatography (CEC) [3]. A chiral stationary phase (CSP) has to meet certain requirements in very competitive environment in order to be widely accepted and applied. The major requirements are universality not only from the viewpoint of coverage of various chiral analytes but also from the viewpoint of applicability in various abovementioned modes and compatibility with various type of mobile phases, stability, robustness, versatility and availability. This presentation summarizes the concept we applied for development of novel polysaccharide-based chiral selectors in 1990s and our current attempts in order to implement chemo- and enantioselectivity in the same CSP, to create stable and robust CSPs by covalent attachment of a chiral selector onto silica and creating CSPs with favorable kinetic properties by using superficially porous silica. In the presentation our strategy for obtaining extremely high separation factor ($\alpha > 100$) in HPLC separation of enantiomers, as well as baseline separation of enantiomers on a few-second timescale will be also demonstrated.

References:

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- [3] S. Fanali, B. Chankvetadze, History, advancement, bottlenecks and future of chiral capillary electrochromatography, *J. Chromatogr. A*, 1637 (2021) 461832.