

**SWAP BETWEEN NORMAL PHASE AND POLAR ORGANIC MODE ON ADMPC  
CHIRAL STATIONARY PHASES**

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**Abstract**

Investigation of enantiomers is a common and important task in the pharmaceutical industry. In vast majority of the cases direct HPLC methods are used with polysaccharide-based chiral stationary phases [1-3]. The reason behind their versatility is the fact that many different chiral environments are accessible on them, due among others to their multimodal nature.

In continuation to our studies about the characterization [4] and the practical assessment of some history dependent chiral chromatographic systems in the polar organic (PO) mode, we extended our investigations to normal phase (NP).

We found that an amylose tris(3,5-dimethylphenylcarbamate) (ADMPC) based column in the alkane-IPA systems exhibited hysteresis phenomenon. The effect can be observed both in heptane-IPA and hexane-IPA systems, and it is in close alignment with the known cost-increasing issue in chiral HPLC, namely that the reproduction of the retentions after swapping the modes is often problematic with polysaccharide-based columns. To avoid this undesirable consequence, column manufacturers advise to dedicate polysaccharide-based chiral columns to eluent modes.

However, we discovered that by a quick rinse with a particular alcohol mixture the normal phase column test of the manufacturer can be reproduced after using the column in polar organic mode. We also found that heptane/IPA mixtures can be used indefinitely, without losing the purchased selectivity, if the IPA content does not exceed 70%.

**References**

- [1] J. Shen, Y. Okamoto, Chem. Rev. 116 (2016) 1094-1138.
- [2] B. Chankvetadze, J. Chromatogr. A 1269 (2012) 26-51.
- [3] E. Francotte, LCGC Europe 29 (suppl) (2016) 31-37.
- [4] S. Horváth, G. Németh, J. Chromatogr. A 1568 (2018) 149-159.