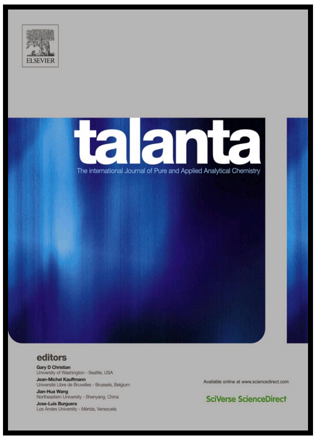

www.elsevier.com/locate/talanta

Novel method for manipulation of anion-exchange selectivity by derivatizing hydroxyl groups in the proximity of quaternary nitrogen ion-exchange sites with glycidol

Christopher A. Pohl

PII: S0039-9140(17)30986-4
DOI: http://dx.doi.org/10.1016/j.talanta.2017.09.042
Reference: TAL17945

To appear in: *Talanta*

Received date: 7 August 2017
Revised date: 15 September 2017
Accepted date: 15 September 2017

Cite this article as: Christopher A. Pohl, Novel method for manipulation of anion-exchange selectivity by derivatizing hydroxyl groups in the proximity of quaternary nitrogen ion-exchange sites with glycidol, *Talanta,* http://dx.doi.org/10.1016/j.talanta.2017.09.042

Novel method for manipulation of anion-exchange selectivity by derivatizing hydroxyl groups in the proximity of quaternary nitrogen ion-exchange sites with glycidol

Christopher A. Pohl

Thermo Fisher Scientific, 1228 Titan Way, Sunnyvale, CA 94085, USA

Abstract: A general approach for the manipulation of anion-exchange selectivity through derivatization of hydroxyl groups adjacent to quaternary anion-exchange sites with glycidol is described. Repetitive reactions with glycidol result in dramatic shifts in the retention of divalent anions. Unique selectivities are observed for specific divalent species resulting in shifts in elution order. Modification of anion-exchange materials with glycidol has a small effect on the selectivity of monovalent anions, but in some cases, significant shifts in selectivity are observed. Use of the synthetic approach for modification of commercially available ion-exchange materials is demonstrated.

Keywords: anion-exchange, glycidol, ion chromatography

1. Introduction

In 1975 Small, et al. [1], introduced the concept of using the combination of an anion exchange column, a strong base eluent and a suppressor column for neutralizing the eluent while converting the analyte ion into a more conductive protonated form. When combined with conductivity detection this approach provided a versatile analytical platform for the analysis of anions (and cations, using a complementary set of components). Since the very beginning of ion chromatography, development of new ion-exchange materials suitable for use with the technique has been a key factor in the development of ion chromatography. Hydroxide is the ideal eluent for anion analysis when using a suppressor because hydronium from the suppressor reacts with the hydroxide from the eluent to produce water.