Fast Separation of Acrylamide Monomer from Acrylic Acid

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The unique selectivity, pH and temperature stability of the ZirChrom®-CARB phase allows baseline resolution of acrylamide and acrylic acid using a 4 minute gradient method.

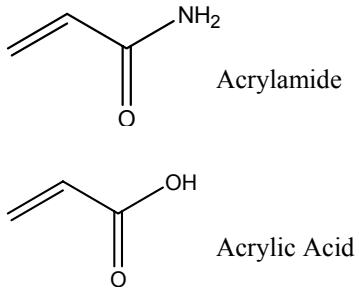

Figure 1: Structures of acrylamide and acrylic acid

Introduction

Small polar molecules such as acrylamide and acrylic acid, (see figure 1), can be difficult if not impossible to separate on conventional reversed-phase bonded silica type phases using HPLC. Acrylamide historically has been analyzed using sample derivitization coupled with gas chromatography (1). The distinctive selectivity and increased retentiveness of the ZirChrom®-CARB phase, compared to bonded silica or polymeric phases, enables the baseline resolution of these small polar molecules.

Experimental

A mixture of acrylamide monomer and acrylic acid was separated using ZirChrom®-CARB.

Column: ZirChrom®-CARB 50 mm x 4.6 mm i.d.
Column Part #: ZR01-0546
Mobile Phase: Gradient elution
A: Acetonitrile
B: 25mM phosphoric acid, pH 1.9

Time	% A	%B
0	0	100
4	25	75

Injection Vol.: 1 µl
Pressure Drop: 180 bar
Detection: UV at 210 nm
Temperature: 40 ºC with Metalox® 200-C
Flow Rate: 2 ml/min

This method is an excellent example of how the enlarged zirconia method development "tool box" can be used to overcome the toughest separation challenges. Using temperature, extreme pH and the unique surface chemistry of ZirChrom®-CARB a fast separation of acrylamide and acrylic acid was achieved using a 4 minute gradient (see figure 2).

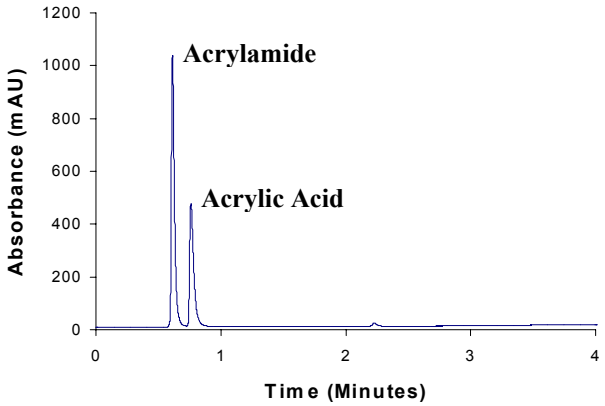

Figure 2: Separation of acrylamide and acrylic acid at 40 ºC using a ZirChrom®-CARB column.

This method can be tailored to your specific application needs. ZirChrom method developers can help you optimize and transfer this method to your site. Please contact ZirChrom technical support at 1-866-STABLE1 or support@zirchrom.com for details.

ZirChrom phases offer unique selectivity for ionic compounds, high efficiency, and excellent chemical and thermal stability.

References

(1) E. Tareke, et al., "Acrylamide: A Cooking Carcinogen?" Chem. Red. Toxicol. 2000, 12, 517-522

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Visit www.zirchrom.com for more application notes using ultra-stable, high efficiency ZirChrom columns.