

Summary

Comparative measurements show that the new Metrosep C 4 cation column has even better separation characteristics than the previous Metrosep C 2 and Metrosep Cation 1-2 column types.

The Metrosep C 4 column has a clearly improved peak shape which leads to a better separation of the individual peaks. Using Metrosep C 4 the number of theoretical plates per meter was noticeably higher than that obtained on the Metrosep C 2 or C 1-2 column. Additionally, for standard cations, transition metals and amines, the Metrosep C 4 column shows better results with respect to peak shape, peak height, resolution and asymmetry factor. The clearly improved resolution of the C 4 column with its narrow and high peaks achieves baseline separation for six standard and six transition metal cations. Analysis times and peak areas obtained with the C 4 column are in the same range as those obtained with its predecessors.

As a result of the latest production methods and materials, the promising Metrosep C 4 column excels by an outstanding separation performance for complex mixtures comprising standard cations, transition metal cations and amines.

Introduction

The choice of the correct separation column is crucial for the success of ion chromatographic separations. The column, apart from being robust and economical, has to cope with the most demanding separation problems and must have reasonably short run times. In order to achieve these goals, the column material has to be continuously improved by applying the most advanced synthesis procedures and production processes.

This poster presents comparative measurements recorded under identical analytical conditions to highlight the advantages of the new Metrosep C 4 column over its predecessors, Metrosep C 2 and Metrosep C 1-2. The number of theoretical plates per meter, the peak height, the resolution as well as the asymmetry factor and the FWHM (full width at half maximum) were determined for standard cations and transition metals as well as for biogenic amines.

Instrumentation

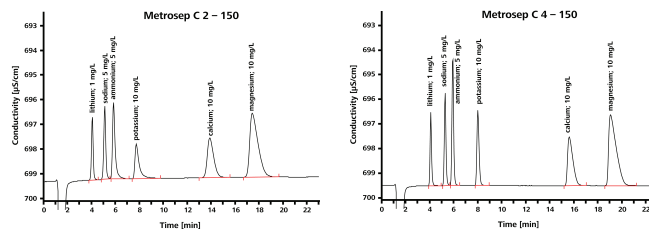


- 850 Professional IC Cation – Prep 2
- 858 Professional Sample Processor

Separation conditions

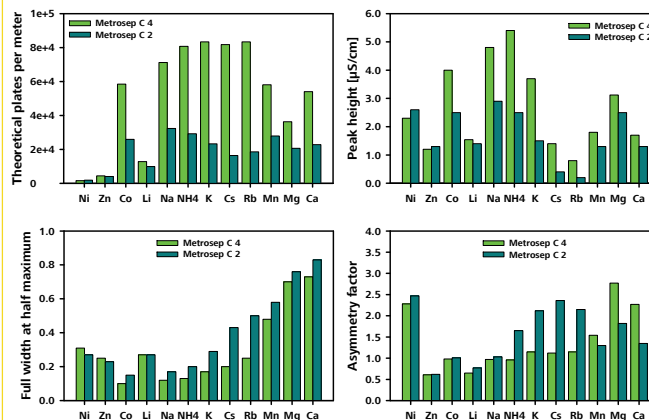
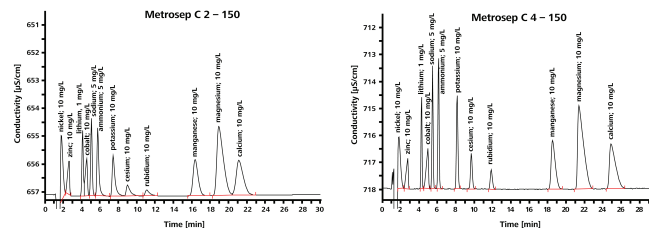
Analytes	Injection volume	Column name	Column dimensions	temperature	Eluent composition	Flow
Standard cations		Metrosep C 2 – 150	150 × 4.0 mm	25 °C	1.7 mmol/L nitric acid 0.7 mmol/L dipicolinic acid	0.9 mL/min
		Metrosep C 4 – 150	150 × 4.0 mm			
Standard cations plus transition metals	10 µL	Metrosep C 2 – 150	150 × 4.0 mm	25 °C	2.0 mmol/L nitric acid 0.13 mmol/L dipicolinic acid	0.9 mL/min
		Metrosep C 4 – 150	150 × 4.0 mm			
Amines		Metrosep C1-2 – 125	125 × 4.0 mm		6.0 mmol/L nitric acid	
		Metrosep C 2 – 100	100 × 4.0 mm			
		Metrosep C 4 – 100	100 × 4.0 mm			

Standard cations on Metrosep C 2 and C 4



Particularly for monovalent cations, the Metrosep C 4 column provides narrower peak shapes and thus a better separation performance than the C 2 column.

Cations and transition metals on C 2 and C 4



With increasing number of analytes, the Metrosep C 4 column provides a better resolution between the individual peaks than the Metrosep C 2 column. The peaks are narrower, higher and more symmetric. Especially for monovalent cations, the C 4 column achieves a very high number of theoretical plates per meter, thus yielding outstanding detection limits.

Amines on Metrosep C 1-2, C 2 and C 4

