LAH 0263 TR/OT/RS/IC/CX



1985 PITTSBURGH CONFERENCE NEW ORLEANS, LA



NO. 1107

ANALYSIS OF CATIONS WITH NEW CATION EXCHANGE COLUMNS BY NON-SUPPRESSED ION CHROMATOGRAPHY

Attached is documentation of a presentation given at the 1985 PITTSBURGH CONFERENCE held in New Orleans from February 25 to March 1, 1985. published abstract is included below.

1107

NO. 1107 ANALYSIS OF CATIONS WITH NEW CATION EXCHANGE COLUMNS BY NON-SUPPRESSED ION CHROMATOGRAPHY

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New cation-exchange resins have been developed by sulfonating highly cross-linked polystyrene-DVB resins to give different levels of function-alization. Cations can be analyzed by non-suppressed ion chromatography with conductivity detection using these resins.

Divalent and polyvalent metal cations can be separated using a polyamine/ organic acid mobile phase in which the ammonium ions act as eluting ions and the organic acids act as complexing agents. Changes in the retention metal ions are affected by

- the capacity of the resin the choice of ammonium and organic acid ions in the mobile phase
- the addition of organic modifiers to the mobile phase

A combination of these changes can be used to optimize the separation of metal ions in industrial samples.

The resin can also be used to analyze organic amines with acidic mobile

A widely used method of analysis is ion-pairing chromatography with U.V. detection. An experimental column is shown to provide a reproducible and sensitive analysis using conductivity detection.

- A separation of ethanolamines is shown and can be affected by -
 - acid group in the eluent capacity of the resin organic modifier

Any questions regarding the paper should be directed to the author listed at the bottom of this page.



AN EXPERIMENTAL CATION COLUMN FOR NON-SUPPRESSED ION CHROMATOGRAPHY

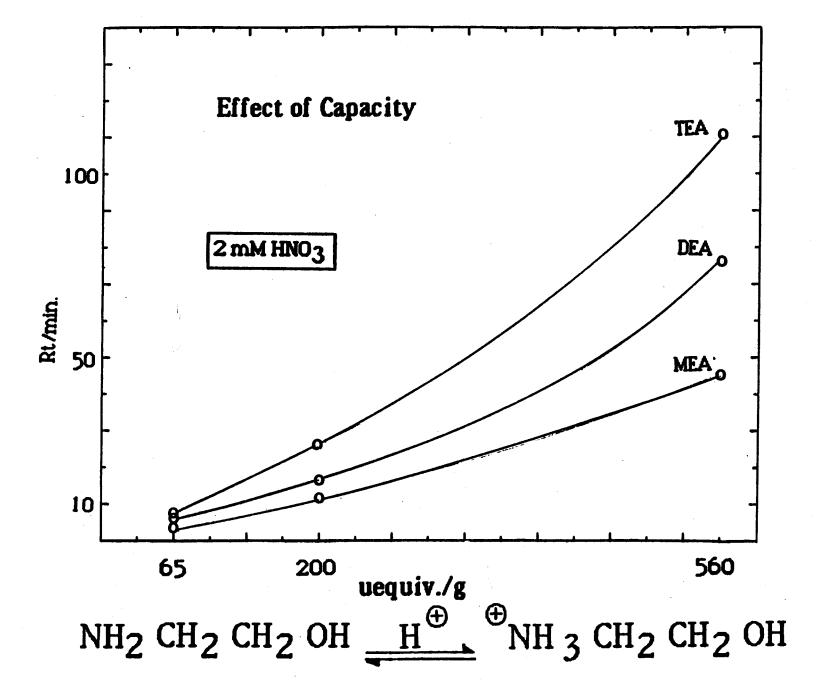
B. BELL C. STACEY H.S. SCHULTZ
G. HARRISON W.R. JONES

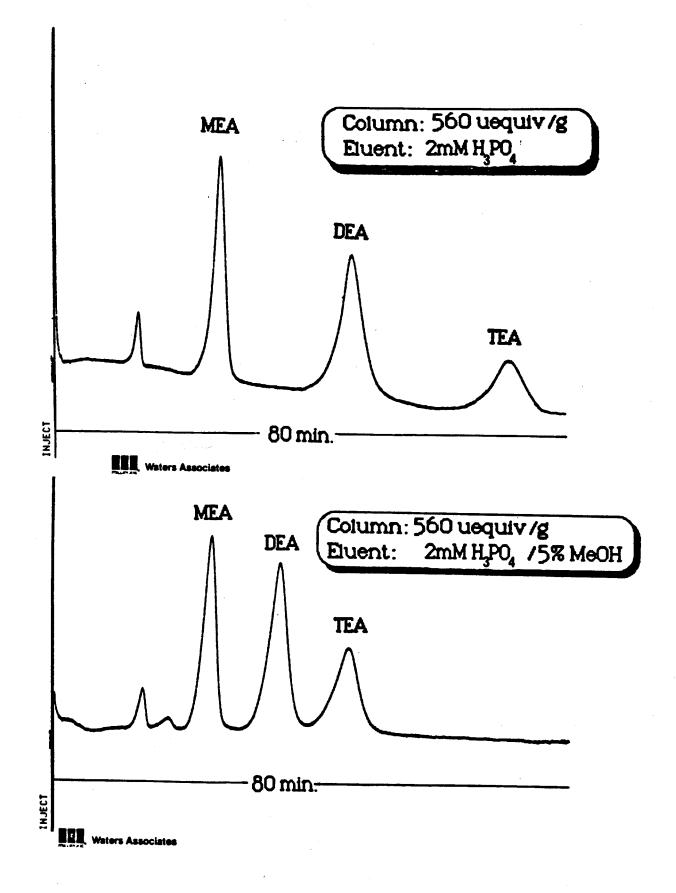
MILLIPORE WATERS CHROMATOGRAPHY DIVISION

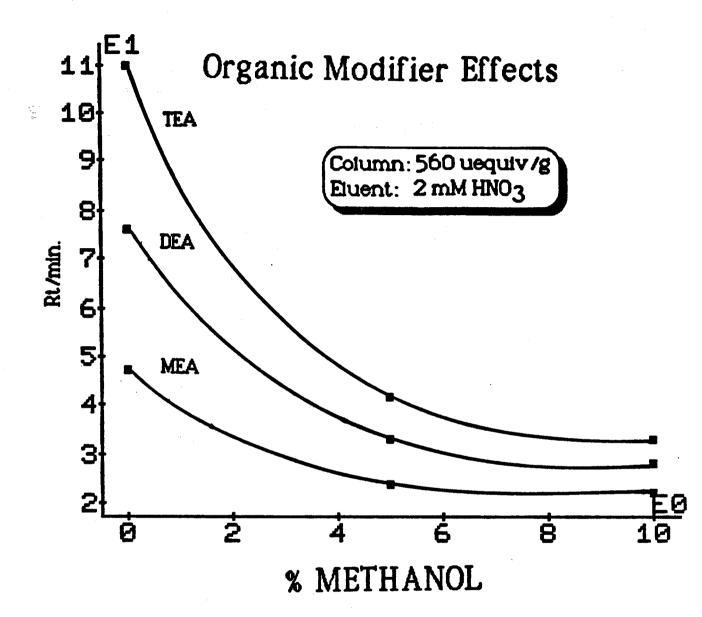
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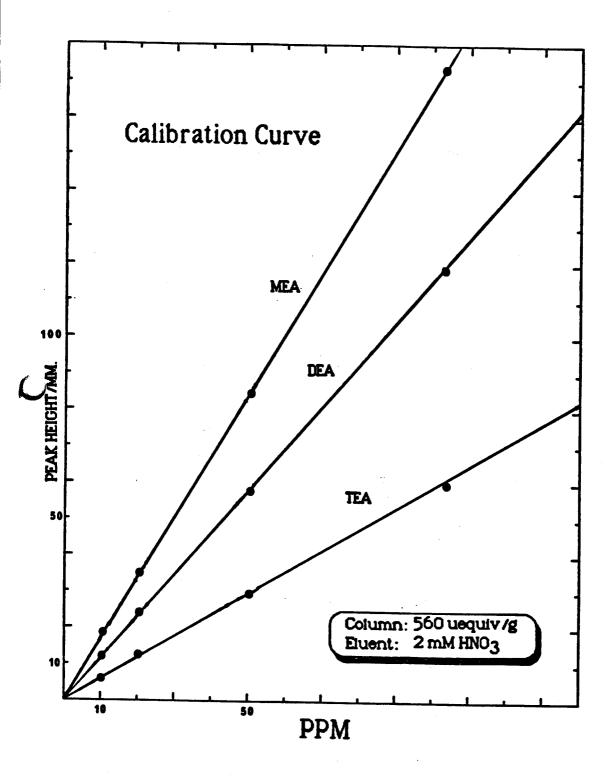
RESIN PROPERTIES

- * styrene-divinylbenzene copolymer
 - * high cross linking
 - * 10 um spherical particle
 - *low levels of functionalization





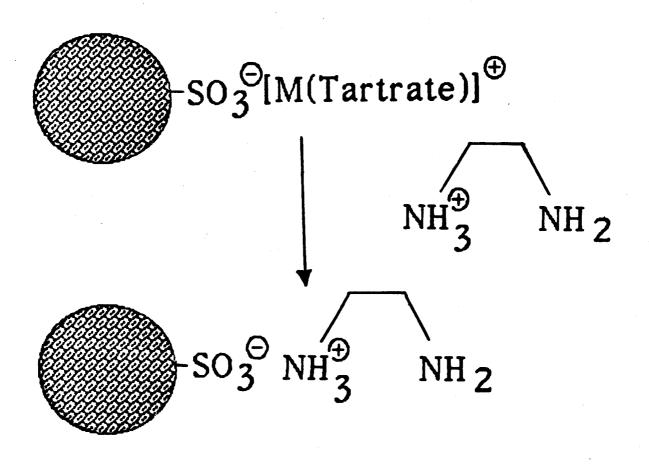




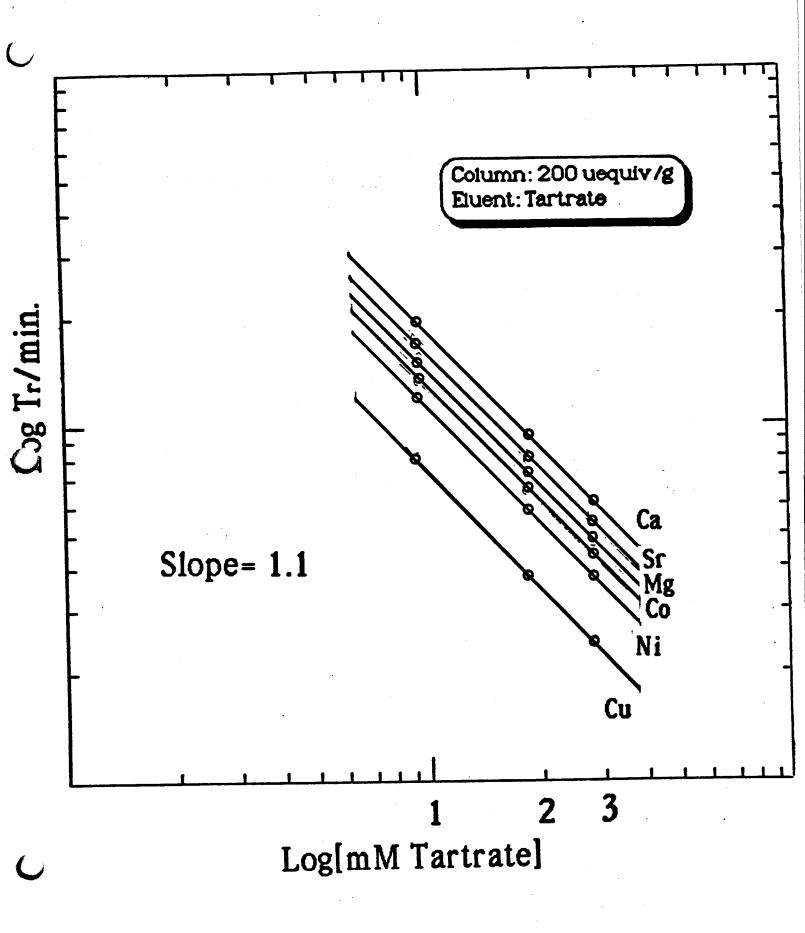
Tartaric acid/EDA pH 4.5

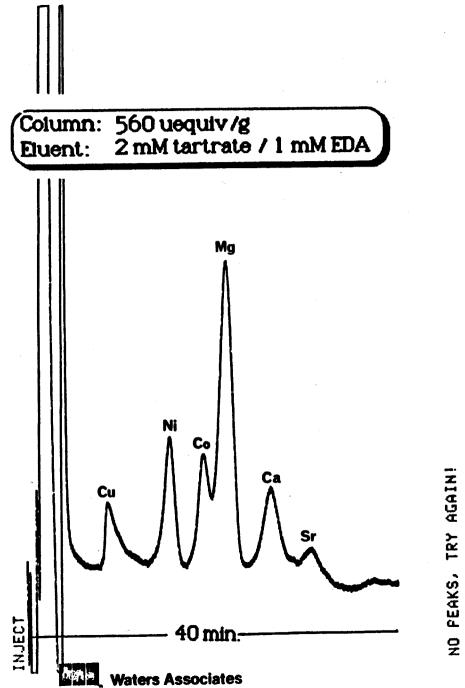
$$M2 + CHOH \longrightarrow [M(Tartrate)]^{\oplus}$$

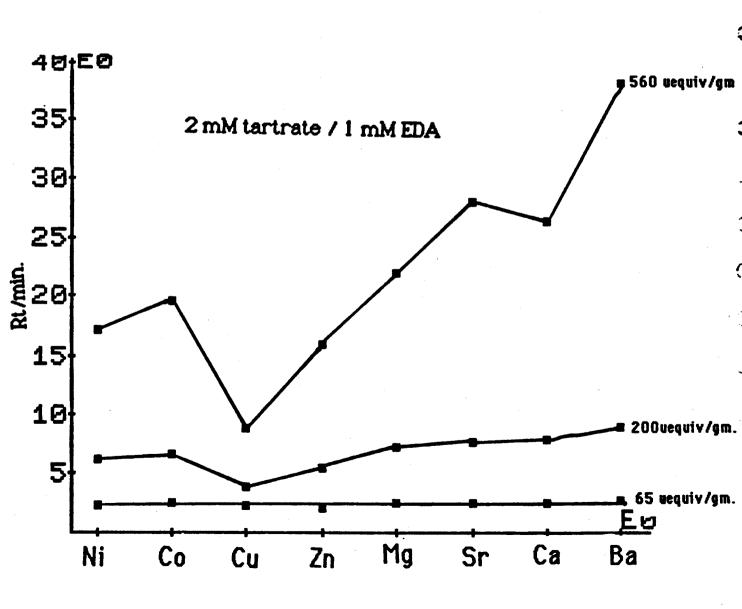
$$COOH$$



[M(Tartrate)]

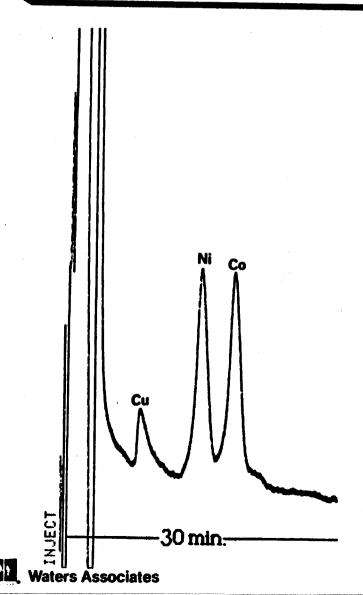






Column: 560 uequiv/g Eluent: 4mM tartrate / 2 mM EDA 20 min. Waters Associates

Column: 560 uequiv/g
Eluent: 2 mM tartrate / 1 mM EDA



Retention of Metals

	2mM Tartrate	2mM Citrate	2mM Succinate
Cd	24.5	•	25.5
Pb	25.3	10.2	•
Co	19.75	9.6	23.55
Ni	17.15	6.5	23.1
Cu	8.8	4.17	22.25
Ba	38.5	•	•
Zn	16.10	8.33	•
Mn	24.45	***	24.45
Mg	22.02	•	21.3
Sr	28.25	•	30.2
Ca	26.65	5.87	28.8

based on 5 x 0.46 cm. column packed with 560 uequiv./g resin

IN CONCLUSION

- * quick equilibration times
- * full range of mobile phases
- * no limitation of organic solvents
 - * simple methods of analysis
 - * direct detection by conductivity