Waters
Lab Highlights
An Internal Communication of Applications and Techniques
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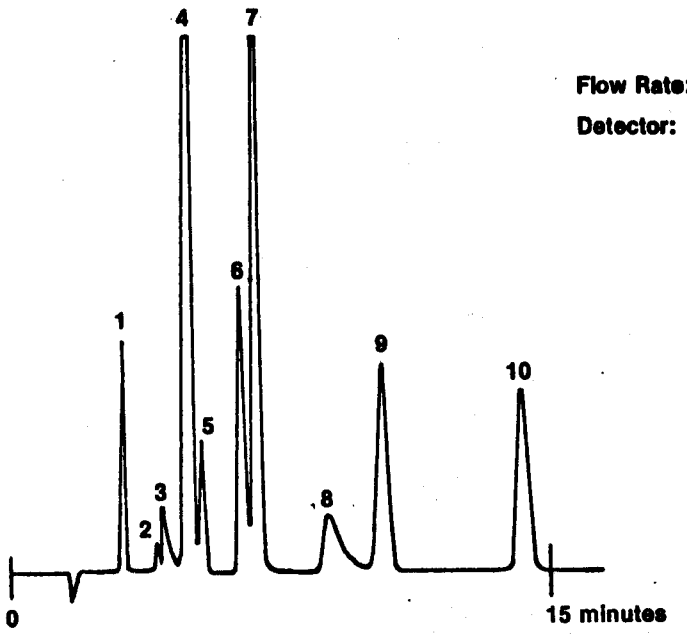
AN/HO,ES/PM,QC/IC/AX

THE CHROMATOGRAPHY OF UV-ABSORBING INORGANIC IONS

A previous Lab Highlihgt on nitrate analysis indicated the potential for separating and detecting UV-absorbing anions using Waters' equipment. This Highlight shows a separation of the most common UV-absorbing anions. Acetate has been included in the ion mixture. Other organic acids can also be analyzed under these conditions. Some matrices (e.g., meat pickling brines) contain weak organic acids as well as inorganic ions. It is possible that such samples could be analyzed using a single set of conditions.

INORGANIC IONS ABSORBING AT 214 nm



Column: μ BONDAPAK™ C_{18}

Mobile Phase: 2L of 0.01M KH_2PO_4 and 1 vial of low UV PIC® Reagent A, pH = 6.0

Flow Rate: 1.5 ml/min.

Detector: Waters Model 441 UV/VIS Detector, 214 nm, 0.02 AUFS

1. Iodate
2. Acetate
3. Bromate
4. Nitrite
5. Bromide
6. Azide
7. Nitrate
8. Chromate
9. Thiosulfate
10. Iodide

400 ng each; except Acetate (1200ng)

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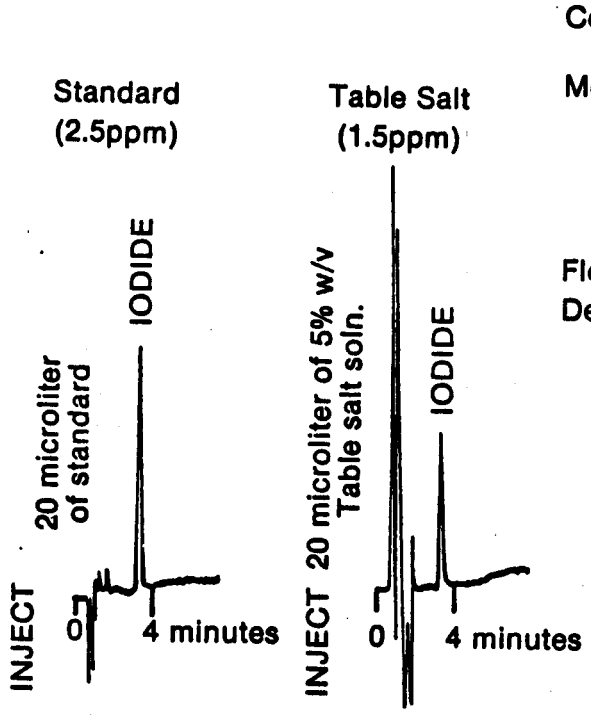
The obvious limitation of UV detection is that many anions (e.g., chloride, sulfate) do not absorb at 214 nm. This selectivity of UV detection can be used to advantage. In the following example, the iodide content of table salt is measured in about four minutes. Using conductivity detection, the chloride peak would overwhelm the iodide. At 214 nm, only the iodide is detected. Another example of this beneficial selectivity is in the analysis of nitrate, bromide, or iodide in sea water.

IODIDE IN TABLE SALT



Column: Radial-PAK™ C_8 Cartridge

Mobile Phase: 10% Methanol: 90% Aqueous ($0.1\ M\ KH_2PO_4$ and 1/2 vial low UV PIC® Reagent A), pH=5.6

Flow Rate: 3 ml/min

Detector: Waters Model 441 UV/VIS Detector, 0.01 AUFS

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