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Highlights

Organic acid analysis of juice provides producers with authenticity, stability, and flavor information. Capillary Electrophoresis with Waters™ NICE-Pak™ Chemistry Package is a unique way to separate organic acids with a minimum of sample preparation. (Tomato juice and similar samples require you to filter the diluted sample prior to injection.)

The results here show that the inorganic anions are well resolved from the organic acids. Also, the phenolics and sugars do not migrate out of the capillary at all and are purged from the capillary automatically before the next injection is made.

This method is quantitative, reproducible, linear, and exhibits good recovery. It is also recommended for orange and grapefruit juice analysis.

Operating Conditions

Sample preparation: Dilute 1.0 ml of juice to 50 ml with HPLC grade water. Filter through a 0.45 µm Millipore® Millex™ HV Filter Unit. Add the internal standard butyric acid, 100 µg/ml, 1:1 and mix well.

System: Waters™ Quanta™ 4000 Capillary Electrophoresis

Capillary: Fused silica, 75 µm X 100 cm

Electrolyte: 5 mM Potassium phthalate, 0.5 mM OFM™ Anion-BT, pH 7

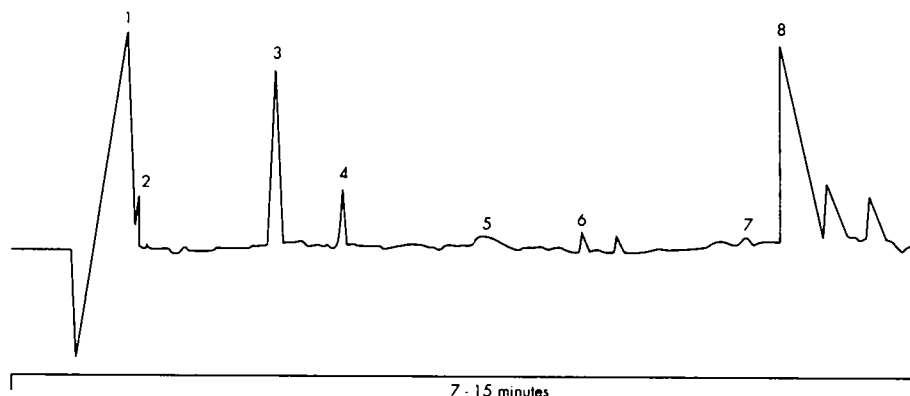
Injection: Hydrostatic 45 seconds

Voltage: 20 kV (Negative Power Supply)

Detection: 254 nm, 0.3 second time constant

Organic Acid	Original Concentration (µg/ml)
1 Chloride	
2 Sulfate	
3 Citric acid	3,579
4 Malic acid	404
5 Phosphate	
6 Acetic acid	99
7 Lactic acid	69
8 Internal standard	

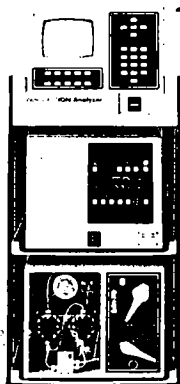
Tomato Juice



Reference

1. Jones, W.R., and Jandik, P., *Am. Lab.*, 1990, 22(9), 51-64.
2. Kenney, B.F., *International Ion Chromatography Symposium*, San Diego, Calif., Poster Presentation (1990).

Ion Chromatography



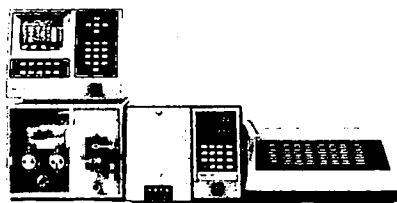
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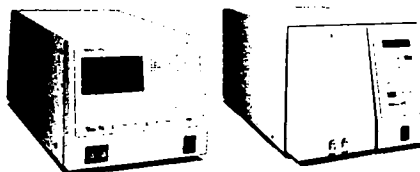
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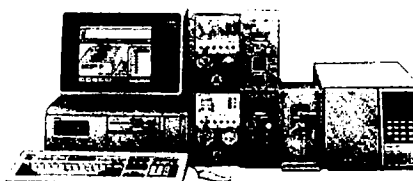
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UV/Vis: photodiode array, fixed, variable and programmable wavelength. Refractive index. Conductivity. Electrochemical. Fluorescence: fixed and programmable/scanning wavelength. Waters offers the food technologist the best choice of detectors to solve separations problems now and in the future.

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Waters offers special-purpose systems for polymer analysis, amino acid analysis, peptide analysis, carbamate analysis, preparative chromatography, LC-MS, and sugar analysis. These systems come with installation and training, optimized methods, quality-tested chemistries, and the right combination of pumps, injectors, and detectors for reproducible analyses.

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Analytical to pilot plant scale chemistries. Bulk media. Specialty columns for amino acids, peptides, proteins, fatty acids, carbohydrates, organic acids, carbamate pesticide residues and polymers. Guard columns. Solid phase extraction cartridges. Radial compression technology. Sample filtration. Robotics. From sample preparation to post-column derivatization, Waters chemical products are essential for doing high-resolution chromatography.

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