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Waters Application Notebook

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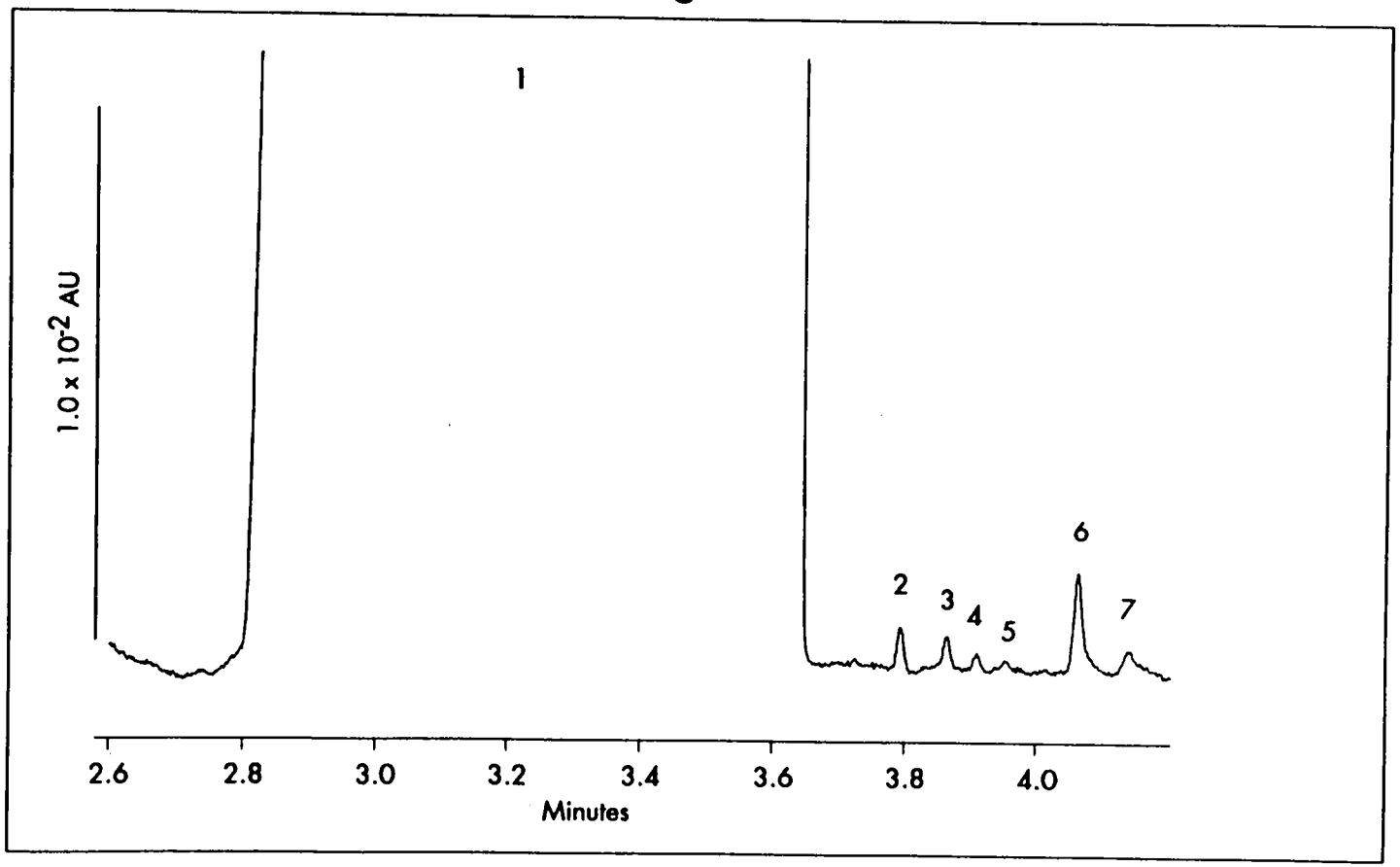
Rapid and Sensitive Determination of Anionic Impurities in High Purity Terephthalic Acid using CIA™



Conditions:

Sample: 99.95% Terephthalic Acid

Capillary: AccuSep™ 75 µm x 60 cm fused silica

Electrolyte: 25 mM sodium hexanesulfonate, 0.5 mM CIA-Pak™ OFM anion-BT, pH 10

Potential: 25 KV (negative)

Detection: 185 nm (direct UV)

Injection: Hydrostatic Mode (10 cm for 30 seconds)

Sample Concentration: 5000 ppm Terephthalate

Sample Preparation: 0.5g solid sample and 1.0 g lithium hydroxide monohydrate plus Milli-Q® water to fill a 100 ml volumetric flask

Peak ID's: (with concentrations injected in [ppm])

1. terephthalate	5000
2. monovalent anion	nq
3. benzoate	0.11
4. monovalent anion	nq
5. monovalent anion	nq
6. p-toluate	0.56
7. monovalent anion	nq

It is important to monitor anionic impurities in terephthalic acid since these trace materials can affect the quality of the final product. Some terephthalate uses are found in the production of polyester fibers for textiles and for soft drink containers. CIA provides a rapid, sensitive and rugged method compared to HPLC methodology. The open tubular capillary is not prone to degradation due to high pH samples and mobile phases as is found with silica based HPLC stationary phases.

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Objective:

To determine the monovalent anionic impurities of terephthalic acid.

Details:

Data Acquisition Rate: 20 points/second

Detector Time Constant: 0.1 second

The CIA-Pak™ OFM anion-BT is converted to a lower UV form prior to analysis via anion exchange resin in the chloride form.

System:

Waters Quanta™ 4000 Capillary Electrophoresis System with 24 position Carousel Waters 860 Data Station

References:

Jones, W.R., Jandik. P, and Weston. A., "Scope of Capillary Ion Analysis", International Ion Chromatography Symposium, Denver 1991(Submitted to J.Chromatogr. symposium volumes)