Isomigration Time Mode™ Eliminates Migration Time Shifts of Analytes in CIA Due to Variations in Sample Conductivity

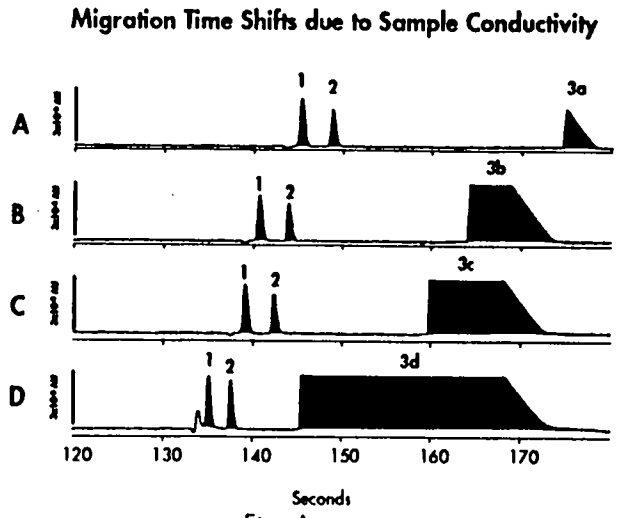

Fig. A

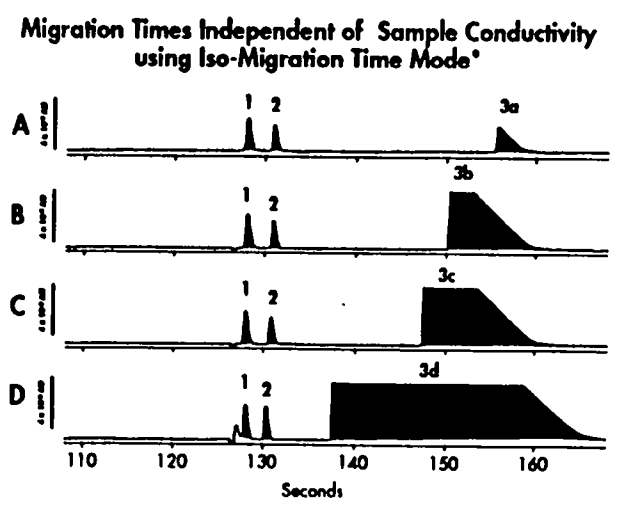

Fig. B

*patent applied for

The rapid and closely spaced peaks found in CIA can place greater demands on data acquisition and processing stations for proper peak identification. Especially when themigration time of the analyte varies as a function of sample concentration (conductivity) (Fig. A). Previously, reference peaks were required to normalize any migration time shift between samples and standards. A new proprietary technology, IMT mode, provides a means to eliminate migration time shifts by (Fig. B) simply entering a code number into the instrument that is specific for a particular application.

Conditions:

Capillary: AccuSep™ 75 µm x 60 cm fused silica
Electrolyte: 5 mM sodium chromate, 0.5 mM CIA-Pak™ OFM anion-BT
Potential: 20 KV (negative) at 18 µA
Detection: 254 nm (indirect UV)
Injection: Hydrostatic Mode (10 cm for 30 seconds)
Auto Purge: Electrolyte for 2 minutes
IMT Method: Parameter ISO = 2*
Temperature: Ambient

*Standard feature on Capillary Ion Analyzer™, upgradable feature on Quanta™ 4000E.

Peak ID's:	ANION	ppm
1.	chloride	4
2.	sulfate	4
3a.	fluoride	4
3b.	fluoride	30
3c.	fluoride	60
3d.	fluoride	300

Objective:

To illustrate the benefit of Isomigration Time Mode™ (IMT) by comparing a series of four different conductivity standards with and without IMT activated.

Four different concentration of F were used to create different conductivity samples. This difference in conductivity causes migration time shifts in the components of interest, Cl and SO_4. Iso-Migration Time routines compensate for these sample conductivity differences to provide migration time reproducibility independent of sample matrix.

Details:

- Data Acquisition Rate: 20 points/second
- Detector Time Constant: 0.1 second
- (See instructions on program card to identify the correct extra parameter designated for the IMT mode designated ISO)
- The baseline perturbation found before peak 1 for Sample D is a result of greater sample conductivity (1519 µS) compared to the electrolyte (1131 µS). This baseline disturbance can be eliminated by either (1) diluting the concentrated sample in water so that the conductivity is less than that of the electrolyte or (2) convert the OFM anion-BT solution to the hydroxide form. (Instructions for this procedure arefound in the details section of Waters Application Notebook #031).

Note: The fluoride peak in standards shown is added to moderate sample conductivity and is not a analyte of interest. Using the IMT mode, fluoride does line up on the tail side of the peak rather than the apex.

System:

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

References: