

## ION ANALYSIS USING LC: ARSENIC SPECIATION

Arsenic speciation is of current interest in the New England area of the U.S. because of the high levels of total arsenic in certain drinking water in New Hampshire. To aid in speedy identification of contaminated wells LC with RI detection and inductively coupled plasma (ICP) detection is being used for arsenic speciation (1,2).

Figure 1 is the chromatogram from the dual detectors used to monitor the elution of the three arsenic anions - sodium arsenite, sodium dimethyl arsenate and sodium arsenate. The total analysis and speciation takes less than 10 mins. In the case of the RI detector, the solvent front slightly overlaps the arsenite peak, but this could be eliminated by increasing the capacity factor for this anion. There is an advantage to using two detectors as additional compounds are present in the water as evidenced by the number of extra RI peaks which are not arsenic containing (since these do not appear at all on the element selective, arsenic specific ICP detector (bottom) at 228.82 nm.)

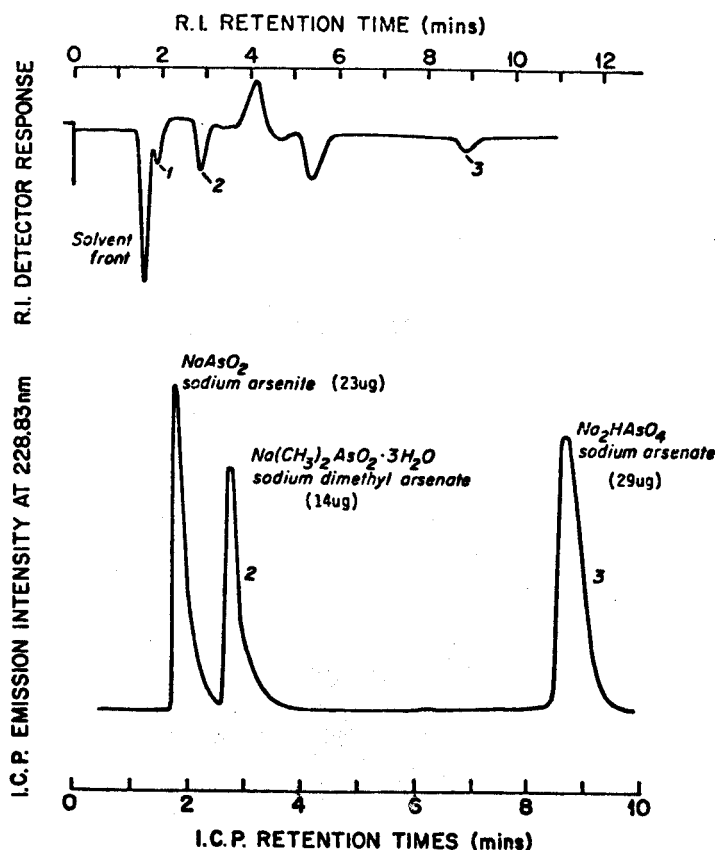


FIGURE 1: Paired Ion RP-HPLC-RI-ICP of Anion Mixture Using PIC<sup>R</sup> A in the mobile phase, flow rate of 1.0 ml/min, Detection is by RI and ICP, Split Ratio of 45:55 (RI:ICP), ICP Wavelength of 228.82 nm (Ref 1).

Paired-ion, reversed-phase LC has been used for several years for the trace analysis of various inorganic anions such as nitrite, nitrate, phosphate, and chloride. Generally, a non-element selective detector has been used such as the Waters refractive index (RI) or ultraviolet (UV) unit as well as conductivity detectors (3). More recently, metals have been studied by paired-ion LC using element selective detectors, such as atomic absorption and atomic emission spectrometers (2).

Furthermore, it has recently been demonstrated that a number of other metal anions can be determined by paired-ion LC with a variety of element selective or general detectors (3, 4). In addition, most, if not all, metal or non-metal cations can be analyzed using these LC approaches.

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