

Inorganic Anions in Groundwater

Analysis of inorganic anions using conventional HPLC instrumentation is now considered routine. Such analyses may be conveniently classified as follows:

- pm; or
- (ii)ppm and higher.

For sub-ppm levels of inorganic anions, sophisticated approaches are usually necessary, e.g., sample pre-concentration, suppression of eluent conductivity or specific detection techniques, as in the electrochemical detection of cyanide and sulphide. Correspondingly expensive instrumentation may be required.

The purpose of this application note is to indicate that for the majority of inorganic anion analyses, at ppm or higher levels, a simple isocratic HPLC system equipped with a UV detector will provide the desired results.

Keywords:

Fluoride, carbonate, chloride, nitrite, bromide, nitrate, phosphate, sulphate, ion chromatography, groundwater salinity studies

In Figure 1, the resolution of seven common anion standards is shown. Fluoride, carbonate, chloride and sulphate in a groundwater sample from a mining site in Queensland are displayed in Figure 2. These separations were performed on a Hamilton PRP-X100 column, which is packed with a polymeric stationary phase stable throughout the pH ranges 1-13.

Spectrophotometric detectors are much less affected by temperature changes than are conductivity detectors, and as a result this analysis can be carried out at room temperature.

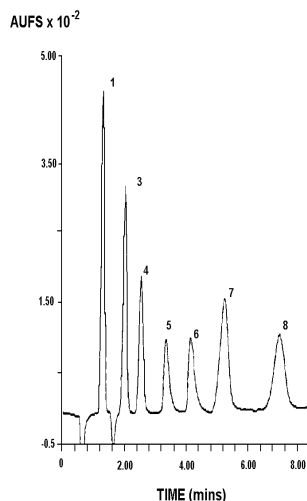


Figure 1 Separation of Anion Standards

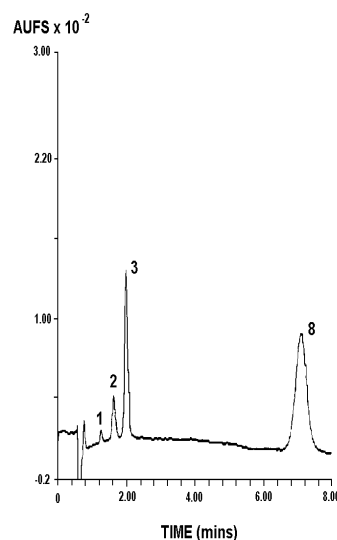


Figure 2 Anions in Groundwater Sample

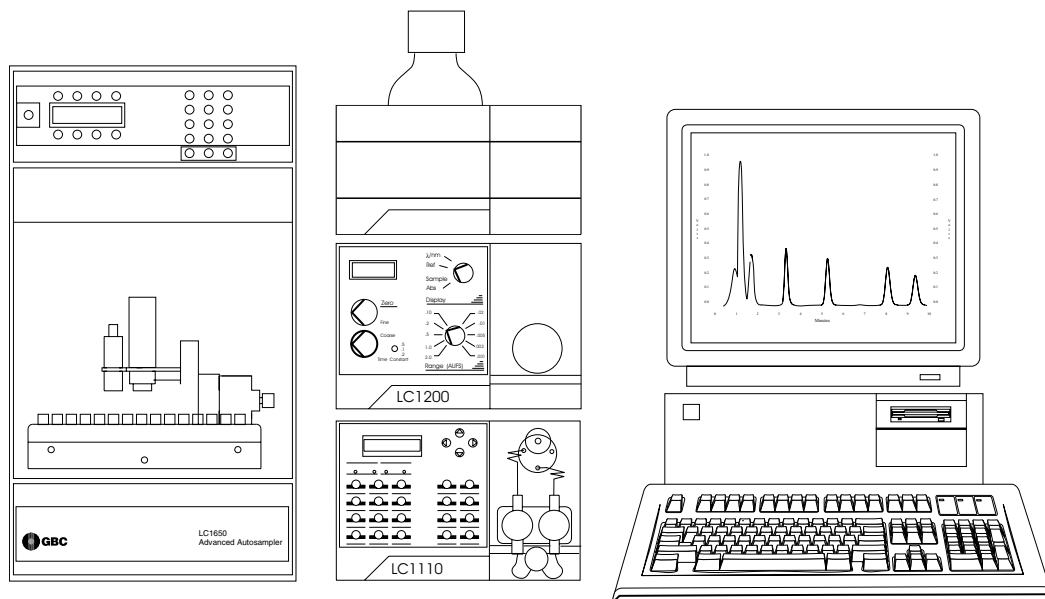


GBC HPLC Instrumentation

LC1110 Dual Piston HPLC Pump
LC1650 Advanced Autosampler
LC1200 Variable Wavelength UV/Vis
Detector
WinChrom Chromatography Data
Management System

Conditions

Column: Hamilton PRP-X100 with
corresponding Guard Column
Mobile Phase: 4 mM p-hydroxybenzoate
(pH 8.5)
Wavelength: 310 nm



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