

UV Absorbing Inorganic Anions

The commonly encountered inorganic anions which absorb UV radiation, indicated above, may be analysed by HPLC by either:

- (i) Ion exchange chromatography on an anion exchange column or
- (ii) Paired ion chromatography on a reversed phase column.

Mobile phases which have low UV absorption, such as phosphate buffers and alkyl sulphonate solutions, are employed in order to optimise sensitivity and linearity of detection. UV detection at lower wavelength, e.g., 210 nm, is preferred for the same reason. Where interferences due to the presence of other UV absorbing sample components are observed, sample pre-treatment may be necessary.

A major advantage of the direct spectrophotometric detection of suitable inorganic anions over conductometric detection is selectivity. In Figure 1, the separation of a standard solution of anions containing 7 ppm nitrite and 9 ppm nitrate together with similar levels of fluoride, chloride, phosphate and sulphate is shown.

Keywords:

Inorganic anions, ion chromatography, azide, bromate, bromide, chromate, iodate, iodide, molybdate, nitrate, nitrite, sulphite, thiosulphate

This demonstrates the ease with which the analysis of UV absorbing ions such as nitrite and nitrate may be accomplished in the presence of a other ions which show little appreciable UV absorbance.

A further example of this is given in Figure 2, where the levels of nitrite and nitrate in a groundwater sample from a mining site were found to be 24 and 60 ppm respectively. The results from this groundwater sample, known to contain approximately 1,700 ppm chloride and 600 ppm sulphate, indicates that this approach may be successful even where there is a large excess of ions which could interfere with conductometric detection techniques.

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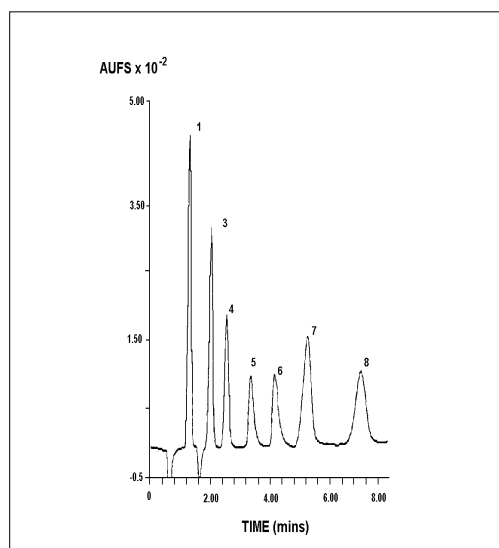


Figure 1 Standards solution

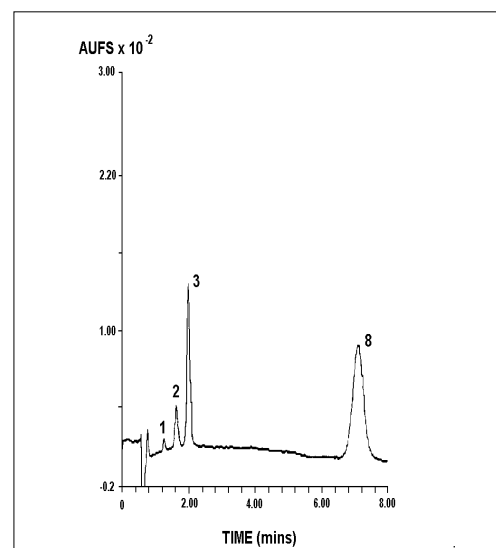


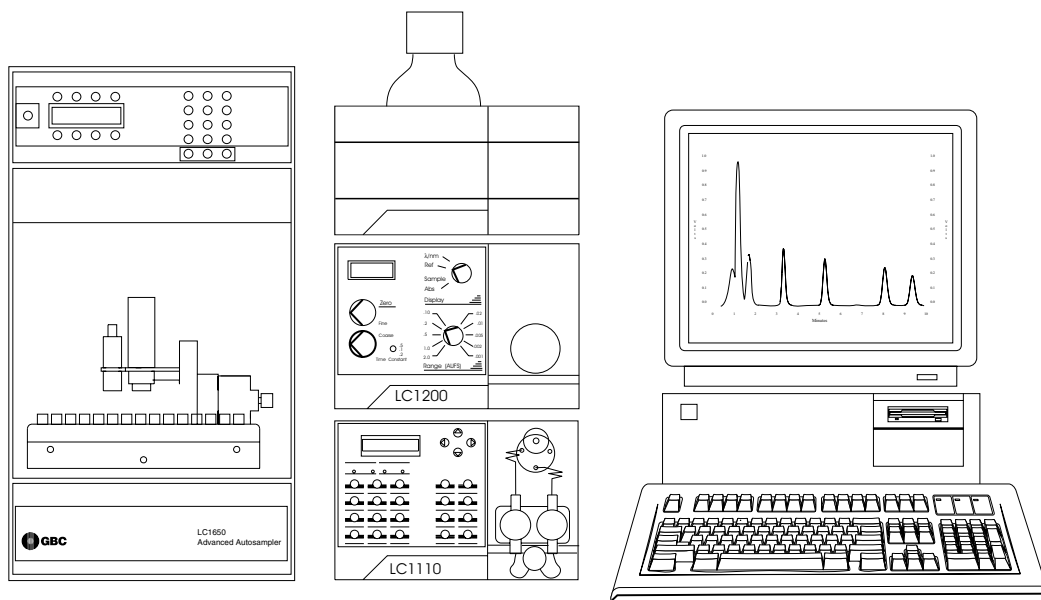
Figure 2 Groundwater Sample

GBC HPLC Instrumentation

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

Conditions

Column: Spherisorb S5 ODS2,
25 cm x 4.6 mm ID
Guard Column: Spherisorb S5 ODS2, 5 cm x
4.6 mm ID
Mobile Phase: 50 mM ammonium phosphate
with 2.5 mM tetrabutyl
ammonium phosphate, pH 6
Wavelength: 210 nm



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