Method Summary

Determination of Anions in Waters and Leachates using Ion Chromatography

Scope and Range

This method is suitable for the determination of anions in waters and leachates (mg/l).

The limits of detection are as set out in Table 1. These are based on validation data for waters.
The calibrated range for all the anions is between the LOD and 200mg/l.

Anion	Limit of Detection (mg/l)
Fluoride	0.10
Chloride	0.08
Nitrite as NO2	0.04
Bromide	0.06
Nitrate as NO3	0.07
Phosphate	0.14
Sulphate	0.10

Table 1 - Limits of Detection

References

none

Principle

An aliquot of the sample is injected onto a liquid chromatography column, where the different anions are separated by ion chromatography and subsequently pass a conductivity detector. The conductivity reading is plotted against time to give a chromatogram for each sample. The peaks on the calibration standards chromatograms are assigned to each of the anions in the order in Table 1. The peaks on the samples are then automatically assigned to each of the anions that are present in the sample, based on the time previously recorded for the standards. All of the sample peaks are then checked for correct integration by the analyst. The integrated area under each sample peak is compared to values from the calibration standards to give a result for each peak identified. Samples to be analysed for anions by IC should be taken using an un-preserved bottle. All samples should be stored refrigerated until ready for analysis.

Interferences

Very large ion concentrations of one peak may mask adjacent peaks in the chromatogram and prevent it from being detected. In this case, gradual dilutions are carried out to reduce the size of the interfering peak and still detect an analysable amount of the peak of interest.
High concentrations of cations will poison the column and suppressor causing poor chromatography and peak reduction in phosphate.

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High concentrations of Nitrate may cause an interference to the sulphate analysis and it may be necessary to dilute the sample to reduce the effect.
Acetate and Formate within the sample will cause interferences to Fluoride recovery due to these compounds coeluting with Fluoride.