



Method Summary

Determination of Low Level Hexavalent Chromium in Waters and Leachates using the Discrete Analyser

Scope and Range

This method is used to determine the concentration of hexavalent chromium ions. The method is validated and accredited to ISO 17025 for ground water, surface water, final effluent and sea water. In house prepared leachates may also be analysed using this method but these are reported as unaccredited.

Working range: 0-0.1 mg/l

Detection limit: 0.003 mg/l

References

APHA/AWWA Standard Methods for the Examination of Water and Wastewater. 20th Edition. 1998. ISBN 0-87553-235-7

HMSO Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1980. ISBN 0 11 7515280

Principle

Preparation and Extraction

Samples should be kept refrigerated prior to analysis and have a holding time of 22 days. The sample is filtered through a 0.45µm inline filter into an analyser cup.

Analysis

Samples are analysed using a colorimetry spectrophotometric analyser. Chromium is considered to be an essential trace element for animals in the natural environment. In the hexavalent state chromium may exist as the chromate ion or the dichromate ion. The hexavalent chromium may be determined colorimetrically by reaction with diphenylcarbazide in acid solution, the reaction being virtually specific for chromium in the +6 oxidation state.

Hexavalent chromium as chromate (CrO_4) may be determined via calculation from the directly measured result.

Interferences

Hexavalent chromium may be remediated from soils by treatment using calcium polysulphide. This compound is a bright orange/yellow colour and may be mistaken as indicative of high concentrations of chromium. In addition, the presence of the compound causes a precipitation to occur when the colour reagent is added, resulting in a falsely positive result. As a result of this, soils or groundwaters which are known to, or are suspected to contain calcium polysulphide are not suitable for analysis using this method.