



Method Summary

Determination of Total organic and Total inorganic carbon

Scope and Range

This method can be used to determine total organic and total inorganic carbon in water samples using OI TOC analysers.

The method is applicable to natural waters, waste water, effluent, groundwater, potable water and leachates.

Detection limit: 3 mg/l

Range: 3 - 125mg/l

Principle

Preparation and Extraction

For Total Organic Carbon (TOC) and Total Inorganic Carbon (TIC) the sample is well shaken before being taken for analysis.

For Dissolved Organic Carbon (DOC) and Dissolved Inorganic Carbon (DIC) the sample is filtered through a 0.45µm filter before analysis.

Samples for TOC/DOC can be run on sulphuric acid preserved samples but TIC/DIC must only be run on unpreserved samples.

Analysis

The analysis is carried out by automated wet oxidation.

TIC/DIC is determined by measuring the carbon dioxide released when the sample is acidified. The CO₂ produced is purged from the acidified sample and detected by a non-dispersive infrared (NDIR) detector. The mass of CO₂ detected is proportional to the mass of TIC/DIC present in the sample.

Once the inorganic carbon has been purged from the sample sodium persulphate is added, this is a strong oxidant that will react with the organic carbon in sample, the sample is also heated to increase this reaction. The CO₂ produced by the persulphate oxidation is purged from the sample and detected by NDIR. The mass of CO₂ produced from this reaction is proportional to the mass of TOC/DOC present in the sample.

Interferences

Large organic particles or complex organic molecules, e.g. tannins, will slow the oxidation, as will highly acidic pH values.

High chloride concentrations will inhibit the reaction, but can be removed by the addition of mercuric nitrate.

Other potential interferences can be caused by plastic containers, oily samples, or atmospheric CO₂ in the dilution water.