

METHOD STATEMENT



Determinand:

Total Organic Carbon (TOC) & Dissolved Total Organic Carbon (DOC)

Matrix:

Treated Sewage, Surface Water, Groundwater, Trade Effluent to Sewer and Trade Effluent to Controlled water.

Principle of Method:

Total Organic Carbon is Carbon present in a liquid in all organic forms. Dissolved Organic Carbon is Organic Carbon present in a sample after membrane filtration.

The sample is mixed with hydrochloric acid and sparged using synthetic air removing inorganic carbon and purgeable organic carbon. Non-purgeable organic carbon (NPOC) remains in the sample. An aliquot of this sample is injected into the high temperature combustion furnace at 825°C where carbon is converted into carbon dioxide. This CO₂ then passes into the non-dispersive infrared detector (NDIR).

The concentration of carbon present in the sample is proportional to the absorbance of CO₂ measured at a wavelength of 4.2µm on the detector and sample volume injected.

Sampling and Sample Preparation:

Samples requiring TOC analysis are collected in 40 ml glass vials by the subsampling team from a 1 litre PET bottle supplied by the customer. For samples requiring DOC analysis the sample is filtered through a 0.45µm membrane filter into 40 ml glass vials by the subsampling team. All samples will be further decanted into 8ml vials from the 40ml sample supplied.

Samples are stable for 12 days (In-house data) from sampling.

Interferences:

No significant interferences affect the results obtained. Any VOC or CO₂ entering the samples or reagents do not interfere due to sparging with synthetic air.

Only CO₂ is measured in the detector so no other oxidised species can interfere.

Performance of Method:

Range of application	1.8 to 250mg/l as C for TOC 1.8 to 250mg/l as C for DOC
Limit of detection	1.177 mg/l as C for TOC 1.746 mg/l as C for DOC
Normal Reporting Limit:	<1.8mg/l as C for TOC <1.8mg/l as C for DOC

Determinand	Low standard		High standard	
	Tot. RSD %	Bias %	Tot. RSD %	Bias %
TOC - Low level Calibration	13.08	5.41	4.09	3.10
TOC - High level Calibration	1.09	1.42	0.82	-0.04
DOC - Low level Calibration	10.90	15.68	3.27	5.24
DOC - High level Calibration	1.97	2.53	1.21	0.98

METHOD STATEMENT



Determinand	Treated Sewage		Surface Water		Groundwater	
	%RSD	%Rec.	%RSD	%Rec.	%RSD	%Rec.
TOC	1.14	97.66	0.99	100.06	0.80	101.3
DOC	-	-	2.53	98.81	-	-

Determinand	Trade to Sewer		Trade to Controlled	
	%RSD	%Rec.	%RSD	%Rec.
TOC	3.44	101.69	2.53	101.44
DOC	-	-	1.17	100.2

References:

The Instrumental Determination of Total Organic Carbon and Related Determinands 1995. Methods for the Examination of Waters and Associated Materials. HMSO ISBN 011 752979 6.