

Fast determination of TOC in seawater with the vario TOC cube

The analysis of saline samples strongly reduce the lifetime of the quartz glass combustion tube and the catalyst of the vario TOC cube. Using a simple change in setup, combining a low combustion temperature with a closed-bottom ash finger containing quartz wool, saline samples can be analyzed with the vario TOC cube without restrictions.

The combustion tube temperature of the vario TOC is reduced to 680°C, so that the sample does not spatter when it enters the hot combustion tube. Moreover, a closed-bottom ash finger containing about 1 cm quartz wool is used, which captures all salt residues.

Various seawater samples with different salinity were analyzed. The samples were acidified with HCl to a pH of 2 in order to outgas the TIC in the sample container and to only analyze the TOC fraction.

SAMPLE	SALINITY [%]	TOC [mg/l]	SD [mg/l]	RSD [%]
Atlantic ocean	3.5	1.89	0.044	2.4
North Sea	3.5	6.78	0.073	1.1
Baltic Sea	0.8	4.63	0.148	3.1
Red Sea	4.0	2.64	0.046	1.7

The relatively high TOC content in the samples indicate that they were taken close to the sea surface. The high relative standard deviation in the Atlantic Ocean and Baltic sea samples are caused by carbon containing particulates abundant in the samples.

By reducing the combustion tube temperature to 680°C and using a closed-bottom ash finger containing quartz wool when analyzing saline samples, the alkaline residues of the sample do not come in contact with the combustion tube and catalyst. Due to this complete matrix separation, the vario TOC cube can be run with saline samples automatically over a long time (more than 600 analyses on one combustion tube and ash finger).

The vario TOC cube is very well suited for the analysis of seawater samples. The low TOC content in seawater can be determined with a high precision.

INSTRUMENT:

vario TOC cube

DETAILS:

mode: TOC

sample: 0.2 ml seawater



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