

TOC/TC analyses in soil with the vario TOC cube

The vario TOC cube can easily be re-configured from liquid to solid mode, so that the instrument can analyse virtually any type of sample: from liquid, particulate containing samples, semi-solids to actual solid samples.

Task

Instrument	Sample
Basis: vario TOC cube	Quantity: 20-210 mg
Mode: solid TC	Consistency: Solid
Periphery: micro balance, solid sample former	Preparation: external acidification with HCl

Specification

For the TC analyses the samples have been weighed into tin boats.

Procedure

For TOC analyses the samples have been weighed into silver boats and acidified using a 1M HCl solution. The acidified samples have been dried one hour at 100 °C and have then been packed into tin boats, in order to enhance the combustion temperature to > 1000 °C (in order to combust the silver completely). The samples cannot be acidified in the tin boats directly since the strong acid will damage the tin packing material.

Two certified soil samples have been analysed in order to test the performance of the vario TOC cube. Furthermore, three soil samples have been analysed.

Sample	weight [mg]	TC [%]	weight [mg]	TOC [%]
soil 4.1% TC	50 – 100	4.10 ± 0.022	50 – 60	3.87 ± 0.029
soil 13.1% TC	20 – 30	12.7 ± 0.040	30 – 40	12.4 ± 0.085
soil-1	70 – 170	1.49 ± 0.006	40 – 80	1.15 ± 0.061
soil-2	170 – 210	1.80 ± 0.008	50 – 70	1.43 ± 0.034
soil-3	30 – 60	3.31 ± 0.028	30 – 70	2.46 ± 0.046

Results

The soil standards have been analysed with a high accuracy and precision. A complete recovery of carbon was achieved. The TC and TOC content of the three soil samples could be analysed with high precision.

Besides the excellent performance of the vario TOC cube for liquid samples, also solid samples can be analysed without limitations.

The vario TOC cube is very suitable for the analyses of solid soil samples.