

DATA BULLETIN

CHNS analysis in soil with IR detection for trace sulfur determination

Deep soil horizons and sediments have low organic matter contents and thus very low concentrations of carbon, nitrogen and sulfur. While carbon and nitrogen are in most cases quantifiable through the standard thermal conductivity detector (TCD), the analysis of sulfur, which is present in concentrations about one order of magnitude lower than nitrogen, requires the utilization of a more sensitive detector. For this reason, UNICUBE® can be equipped with an optional IR detector, which is capable of measuring sulfur concentrations down to 2 ppm.

Different soil samples were weighed into tin foils and analyzed six times with a standard method. A manual pressing tool was used for compressing the samples into the form of a little pellet. Average CHNS concentrations and the absolute standard deviation of the measurements are shown below.

SAMPLE	C [%]	H [%]	N [%]	S [%]
Arenosol Ah horizon	7.494 ± 0.083	1.100 ± 0.015	0.4213 ± 0.0053	0.4870 ± 0.0016
Arenosol Ah-elCv horizon	1.848 ± 0.008	0.204 ± 0.006	0.0485 ± 0.023	0.0078 ± 0.0004
Arenosol elCv horizon	1.771 ± 0.014	0.094 ± 0.001	0.0056 ± 0.0009	0.0049 ± 0.0002

Sulfur concentrations down to the single digit ppm range are reliably determined with UNICUBE. In the above example, the elCv horizon soil samples with a sulfur concentration of 49 ppm produced an IR detector signal of 4800 to 5100 area units. As the blank signal is only about 0-10 area units, this signal represents a huge peak detected by the IR detector. This in turn demonstrates that much lower concentrations of sulfur are still detectable in a robust and reliable way.

Experience UNICUBE as a true workhorse in elemental analysis laboratories, combining best limits of detection and best accuracy with tool-free maintenance, extraordinary instrument uptime and lowest noise emission in the industry.

INSTRUMENT:

UNICUBE®

DETAILS:

mode: CHNS (S with IR)

sample: 100-150 mg soil



Elementar Analysensysteme GmbH
Elementar-Straße 1
63505 Langenselbold (Germany)
phone: +49 (0) 6184 9393-0
info@elementar.de | www.elementar.de

