

DATA BULLETIN

When to use an IR detector on the vario EL cube?

There are two ways to increase the performance of an elemental analyzer for samples with low sulfur concentrations. Either increase the sample weight in order to increase the absolute amount of sulfur in the detector, or increase the sensitivity of the detector. The vario EL cube with its large dynamic range allows measurements of samples in the low microgram as well as in the two-digit milligram range. Moreover, the vario EL cube can be equipped with an IR detector for the determination of very low S concentrations. This data bulletin shows the performance of the IR and TCD detectors and when the use of an IR detector is useful.

Soil and plant samples were weighed into tin boats with different sample weights. Tungsten trioxide powder was added to the soil samples in a ratio 1:1 to bind the earth alkaline/alkaline ions. All samples were analyzed five times in S mode with IR detector and five times with TCD detector. The results are given below.

SAMPLE	SAMPLE WEIGHT [mg]	S content [$\mu\text{g abs}$]	S / IR [%]	S / TCD [%]
sand	10	4	0.039 ± 0.004	not detectable
soil	10	3	0.029 ± 0.002	not detectable
leaves	2	3	0.154 ± 0.004	not detectable
soil	100	30	0.030 ± 0.002	0.027 ± 0.003
sediment	100	26	0.026 ± 0.001	0.022 ± 0.001

The results show extremely low standard deviations for the sulfur analyses with TCD and IR detector. For samples with a low absolute sulfur content, the signal of the TCD is below its detection limit and no reliable measurements could be made. Here the use of an IR detector is essential.

For samples with extremely low sulfur concentrations, especially when the amount of sample material is limited, we recommend the use of an IR detector for reliable sulfur measurements.

INSTRUMENT:

vario EL cube

DETAILS:

mode: S with TCD / S with IR

sample: 2–100 mg soil and leaves



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