APPLICATION NOTE

TRL INSTRUMENTS

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Total Organic Carbon (TOC) Measurement of Soil Samples by TRLI-TOC

1. Introduction

Soil carbon which includes both inorganic carbon and organic carbon, plays important role in the carbon cycle so it is significant for environmental issues. Total organic carbon (TOC) content of the soil is one of the most important constituents of soil because of the capacity to affect agricultural products growth. Therefore, determination of total organic carbon (TOC) in soil is important about agricultural concerns. TOC content of soils can be measured by directly or by difference method (TOC=TC-IC) after inorganic and total carbon contents are measured. In this study, total organic carbon (TOC) of six different soil samples were determined by difference method with TRLI-TOC analyzer.

Sample Description: Soil Sample - Solid

2. Experimental Condition

Total carbon (TC) and inorganic carbon (IC) measurements were made by TRLI-TOC analyzer under the following conditions for six soil samples without any pretreatment.

Parameters	Total Carbon (TC)	Inorganic Carbon (IC)
Decomposition Area Temp.	850 °C	-
Catalytic Area Temp.	500 °C	-
Air Pressure	2 bar	2 bar
Carrier Gas Flow Rate (TC)	100 mL/min	100 mL/min

3. Results

IC Results: IC results showed that there is no IC in neither of the samples, therefore TC results are equivalent to TOC.

Sample No.	Sample Size (mg)	TC Average	RSD (%)
1	8000 mg	738 ppm	1.34
2	750 mg	1.284 %	0.16
3	500 mg	1.843 %	1.80
4	100 mg	13.113 %	0.42
5	50 mg	23.243 %	0.20
6	30 mg	38.358 %	1.24

4. Conclusion

In this study, six different solid soil samples were analyzed in duplicate with TRLI-TOC without any pretreatment. According to IC analysis results, there is no IC in the samples, so TC is equivalent to TOC in the samples. RSD values of the results are less than %3 in all, even less than % 1 in some showed repeatable analysis. The results shows that TRLI-TOC provides wide measurement ranges from low ppm high percentage carbon contents.
On the other hand, sample 6 were analyzed by loading 30 milligrams while sample 1 analyzed by loading 8 grams that is; TRLI-TOC can either