APPLICATION NOTE

TRL INSTRUMENTS

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

1. Introduction

The aim of this publication is to show reliability of our TRLI-TOC analyzer in measuring TOC concentration of the industrial waste samples. Determination of TOC is based on the principle of TOC=TC-IC. Total Carbon (TC) and Inorganic Carbon are measured during the analysis. Details on the repeatability of the assay and the empirical findings are presented below.

Sample Description: Unknown Salt Sample - Solid - Crystalline

2. Experimental Conditions

Before starting the experiment, the samples are dissolved in water by 1/10 ratio. The measurements are done under following settings of the analyzer:

Parametre	Value
Decomposition Zone Temp.	900 °C
Catalytic Zone Temp.	750 °C
Air Pressure	1.5 bar
Carrier Gas Flow Rate	250 mL/dk

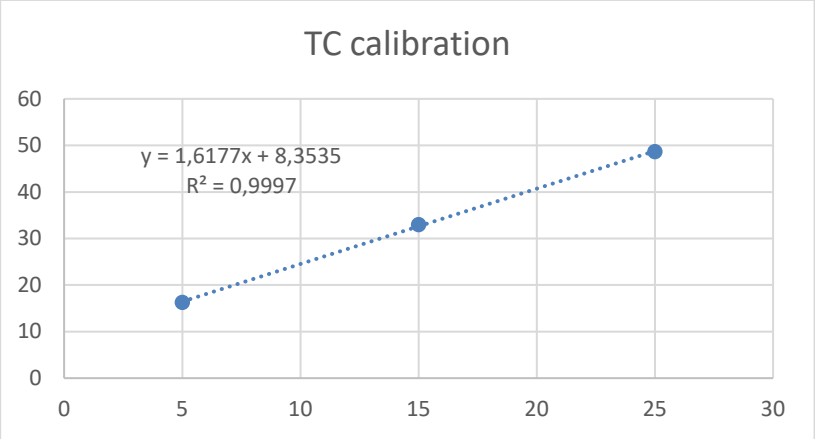
3. Calibration

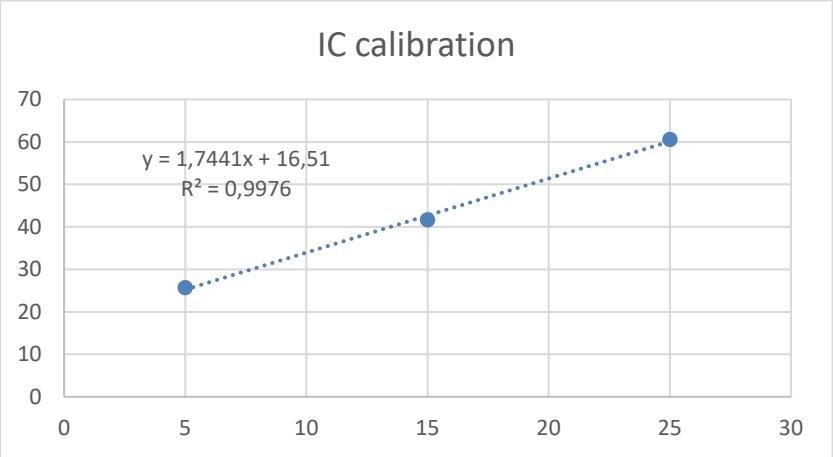
Calibration is done by waging solution having below specification and calibration curves are below.

Standart Name	Standart Concentration
CaCO3 (for TC)	12%
KHCO3 (for IC)	50 ppm

Calibration Equation (TC)	R^2
$y = 1.6177x + 8.3535$	0.9997

Calibration Equation (TC)	R^2
$y = 1.7441x + 16.51$	0.9976





4. Results

The TC and IC content for the unknown salt samples are calculated by the TRLI-TOC software, along with the RSD values, are as follows:

Table 1: Unknown Salt Sample 1 TC Result (dissolved in water by 1/10 ratio)

Repeat Number	Sample Size(mL)	TC Result (ppm)	TC Average (ppm)	RSD (%)
1	0.5	211.325	207.742	2.329
2	0.5	207.742		
3	0.5	202.238		

Table 2: Unknown Salt Sample 1 IC Result (dissolved in water by 1/10 ratio)				
Repeat Number	Sample Size(mL)	IC Result (ppm)	IC Average (ppm)	RSD (%)
1	10	14.593	14.734	0.830
2	10	14.813		
3	10	14.796		

Table 3: Unknown Salt Sample 2 TC Result (dissolved in water by 1/10 ratio)				
Repeat Number	Sample Size(mL)	TC Result (ppm)	TC Average (ppm)	RSD (%)
1	0.5	139.562	137.621	2.408
2	0.5	133.795		
3	0.5	139.507		

Table 4: Unknown Salt Sample 2 IC Result (dissolved in water by 1/10 ratio)				
Repeat Number	Sample Size(mL)	IC Result (ppm)	IC Average (ppm)	RSD (%)
1	10	20.756	20.625	0.978
2	10	20.641		
3	10	20.478		

TOC concentrations are calculated as the difference between TC and IC:

Table 5: Unknown Salt Samples TOC Result	
Sample No.	TOC Calculated (ppm)
1	196.4
2	117.0

5. Conclusion

In this study, the total carbon (TC) and total inorganic carbon (IC) contents of unknown salt samples were calculated. Following the analysis conducted with 2 different unknown samples, as can be seen in the results section of the report, high repeatability of results was obtained for all samples using the TRLI-TOC analyzer. Since the unknown samples were salt samples, they were dissolved before analysis to minimize abrasion on the boats and catalyst.