

Continuous Monitoring of Total Organic Carbon (TOC) in High Concentration Suspended Particulate Containing Waste Water

Introduction

Fast monitoring of total organic carbon (TOC) of waste water is crucial for some environmental and industrial applications. Determination of total organic carbon (TOC) in waste water is complex when water contains high concentration of suspended particles. Generally, inorganic carbon content of the water is much higher than the organic carbon, TOC determination by difference method will not be suitable because it can lead to large statistical error [1]. Therefore, NPOC method (non purgeable organic carbon) is used for the analysis of water samples. Firstly, water sample is acidified to pH value of 2 or below. After all the inorganic carbon is purged, the residual carbon is analyzed as non-volatile organic carbon. In this work, TOC in synthetically prepared waste water, which has high concentration of suspended particles below 600 μ m, was monitored with [Trl-onlineTOC-hSS analyzer](#).

Principle of operation

Waste water samples were prepared synthetically by mixing tap water with sieved soil fractions. Samples were periodically introduced to a sparger for

acidification automatically to purge the inorganic carbon. Then, 300 μ l of the acidified sample was introduced into a two-zone furnace by the help of a peristaltic pump which prevents any blockage at the process lines.

Table 1: Analysis Parameters

Parameters	Total Carbon (TC)
Decomposition furnace temperature	800 °C
Catalytic furnace temperature	500 °C
Air pressure	2 bar
Carrier gas flow rate	100 mL/min
Analysis period	20 minutes
Sample Size	300 μ L
Spurge Time	4 minutes
Acidification	0.5 % by volume

Results

In figure 1, obtained TOC results were shown by analyzing 5 g/L TSP (below 600 μ m) containing waste water. The RSD value of the results calculated as 6.40%.

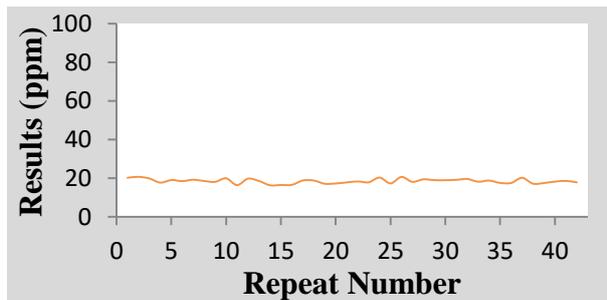


Figure 1: Graphical representation of TOC results of 5 g/L TSP (below 600µm) containing waste water

In figure 2, TOC results were shown by analyzing of of 3 g/L TSP (below 600µm) containing waste water . The rsd value of the results calculated as 6.23 %.

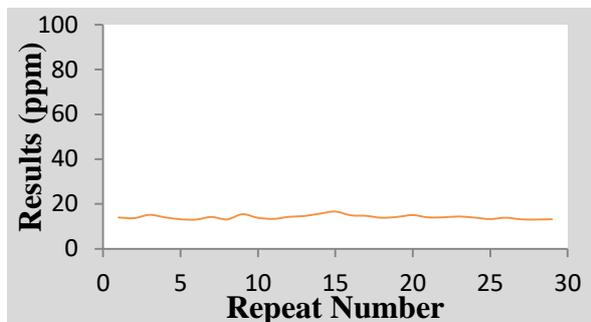


Figure 2: Graphical representation of TOC results of 3 g/L TSP (below 600µm) containing waste water

Conclusions

In this study, TOC in waster water [Trl-OnlineTOC-hSS analyzer](#). Waste water sample is synthetically prepared with soil particles below 600 µm with two different concentration. In many application, analyzing of high tsp containing liquids is very difficult due to particulate character of the sample however according to results online monitoring of TOC of high tsp containing sample was achieved with Trl-OnlineTOC-hSS succesfully. As regards

results, Trl-OnlineTOC-hSS can analyze samples have very high tsp concentration up to 600 µm particle size with reasonable RSD values without any blockage or any other problem at the process lines.

References

[1]: TOC-ISO/CEN norms. (n.d). Retrieved March 04, 2016, from <http://www.stateofheart.it/TOC-ISO.htm>