

Continuous Monitoring of Total Organic Carbon (TOC) of Surface Water

Introduction

Monitoring TOC (Total organic carbon) of water is an important parameter since the quality of the water from sources such as rivers, lakes, reservoirs determines the tap water treatment process. The total organic carbon (TOC) of the tap water is such an significant parameter in terms of tap water quality. Fast monitoring of the TOC in surface water, coming to water production units, is essential since produced tap water is often distributed in a few hours. Inorganic carbon content of 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. European Standardization EN 1484 indicates that the difference method can only be applied when the TIC (total inorganic carbon) value is smaller than the TOC value [1]. For the analysis of water NPOC method (non purgeable organic carbon) is therefore used. Firstly, water sample is acidified to pH value of 2 or below. After all the inorganic carbon purged, the residual carbon analyzed as non-volatile organic carbon. In this study, intake raw water in tap water production unit was monitored during five days with [Trl-Online TOC Monitor](#).

Principle of operation

Water samples, periodically introduced to sparger, were acidified automatically in the sparger to purge the inorganic carbon. Then, a small portion of the acidified sample introduced into two zone furnace by the help of high precision FMI pump on the instrument.

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 | 1000 mL |
| Sparge Time | 4 minutes |
| Acidification | 0.5 % by volume |

Results

Obtained results during 5 day at a tap water production unit, were shown in figure 1. [Trl-Online TOC Monitor](#) analyzed raw water samples once every 20 minutes and reported it by software.

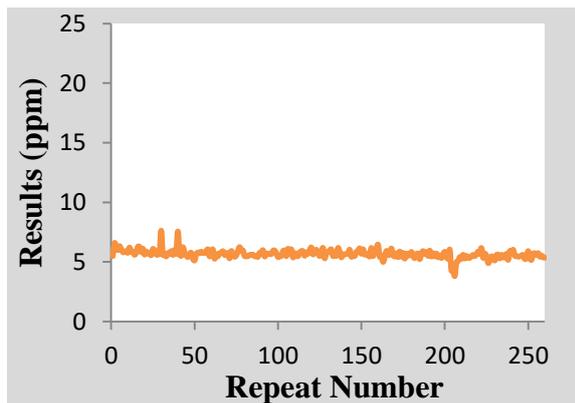


Figure 1: Graphical representation of TOC results of raw water in unit during 5 days

Conclusions

In this study, TOC of surface water in a tap water production unit were analyzed once every 20 minutes automatically by Trl Online-TOC Monitor without any user intervention. Water samples introduced through the sparger from a process stream, automatically and its TOC content analyzed after its inorganic content is purged in the sparger with high sparging efficiency of [Trl-OnlineTOC Monitor](#). As shown in the figure 1, during 5 days 260 analysis were done by Trl-Online TOC Monitor and repeatable analysis results are observed.

References

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