Challenge

Introduction of total organic carbon (TOC) as preferred method for wastewater monitoring

Solution

Analytik Jena offers an optimized direct sample injection solution for the simultaneous determination of the TOC and TN_b parameters - especially for wastewater monitoring.

BREF Regulation - Wastewater Monitoring by TOC/TN_b in the EU

As a result of the implementation of the EU Industrial Emission Directive (IED), the total organic carbon (TOC) parameter is being introduced broadly into the monitoring of wastewater in various industries. In the industry, documents regarding the best available technologies (BAT, BREF – Best Reference), the modern TOC parameter is preferred compared to the conventional chemical oxygen demand (COD) parameter.

Why is TOC preferred compared to COD?

- TOC is uniformly regulated across Europe by the EN 1484 standard
- There is no European norm for the COD parameter
- The benefit of TOC is that it does not rely on the use of very toxic compounds
- According to site-specific correlation factors, it is easy to convert the TOC values into the previously used COD results, in order to maintain a continuity between the two systems

European BREF regulations are going to become effective with national Wastewater Ordinances within 2018/19 for a first selection of industry sectors. This triggers the TOC parameter to play a central role for wastewater monitoring, which primarily concerns the production of **pulp, paper and board** and the **oil refining industries**. Other industries are set to follow suit in the near future – especially the **waste treatment** sector, **wood-based panel production** and the **chemical industries**.

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Daily Measurements of TOC

The measurement frequency of the TOC and TN_b parameters (Total bound Nitrogen) will increase according to the new regulations. Currently, wastewater samples have to be tested daily according to these parameters (2- or 24-hour mixed sample). The affected industries need immediate analysis solutions that are optimized for high throughput and rapid processing. As a result, the daily measurements prescribed by the EU wastewater laws will become a routine task in many industry labs.

Analytik Jena recommends:

Especially for wastewater monitoring Analytik Jena offers an optimized direct sample injection solution for the simultaneous determination of the TOC and TN_b parameters by multi N/C 2100S. Multi N/C 2100S is the only catalytic high-temperature combustion device on the market employing a sample handling technique, which almost entirely eliminates sample carry-over or particle clogging by the septum-free direct injection using a micro liter syringe with a wide bore needle (0.7 mm I.D.).
This differentiates our solution from other vendors, which are typically offering flow injection analyzers using long, tiny hoses and multiple valves, which tend to get clogged and support carry-over effects.

Relevant setup*:
- multi N/C 2100S + ChD (order number 450-200.101-3)
- Autosampler AS 60 (order number 450-126.682)

For higher sample throughput, an alternative solution is our multi N/C 3100.
It combines fast measurement times with robust particle handling by a sample dosing ceramic valve with standard internal diameter of 0.8 mm.
With it's unique reverse rinse technology in combination with the active needle rinse of the AS vario ER, this flow injection TOC/TN_b analyzer is well prepared for particle loaded wastewater sample analysis. Our solution, applying sample loop injection is ahead of competitors' offers using syringe pump injection, which is prone to wear by particles and supporting carry-over effects.

Relevant setup*:
- multi N/C 3100 + ChD (order number 450-200.501-3)
- Autosampler AS vario ER (order number 450-900.148)
- Rack 100 pos. (order number 450-900.146-ER)

*Detection of TN_b can be swapped from ChD to CLD, if demanded by customer.

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