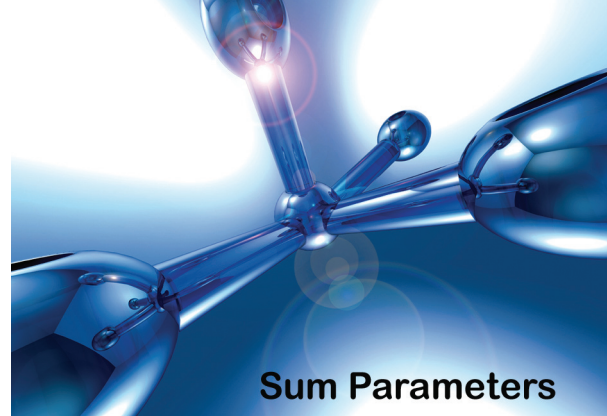


Application Note

Determination of drinking water with TOC-V CPH



European Drinking Water Directive

Indicator parameter

The new European drinking water directive introduces, for the first time, the category of indicator parameter value specifications. These are not directly linked to health problems but have an indicator function. This list of indicator parameters also includes the TOC value (total organic carbon), which has not been assigned a limiting value or criterion but can be considered as a cautionary warning for action under unusual circumstances.

Oxidizability

Another indicator parameter included in the list is oxidizability. This is a measure for the sum of all chemically oxidizable organically bound compounds present in water. With reference to drinking water limiting values, this parameter is no cause for direct health concern but can lead to regermination or undesirable disinfection byproducts. Oxidizability is proportional to the sum of organically bound carbons that are determined as DOC (dissolved organic carbon) or TOC. Oxidizability can therefore be replaced by the TOC parameter. The frequency of determination of the parameter indicators depends on the volume of water that is produced or released in a water supply area.



TOC determination in drinking water

When examining carbon compounds in drinking water, it is apparent that the amount of inorganic carbons, such as carbonates and hydrogen carbonates, is much higher than the organic fraction. The organic fraction is only 1% of the total carbons. A TOC determination via the differential method ($TOC = TC - IC$) will not be appropriate in this case, as the calculated TOC value is prone to large statistical errors. According to EN 1484 (instructions for the determination of total organic carbon and dissolved organic carbon), the differential method can only be applied when the TIC value (total inorganic carbon) is smaller than the TOC value.

For drinking water analysis the NPOC method (non purgeable organic carbon) is therefore used. The drinking water sample is first acidified to a pH value of 2. This way the carbonates and hydrogen carbonates are transformed into carbon dioxide. The CO_2 is then removed via sparging with carrier gas. The amount of volatile and therefore spargeable organic carbon can be disregarded in drinking water. What remains is a solution of non-volatile organic carbon compounds. These can be oxidized to CO_2 and detected via NDIR.

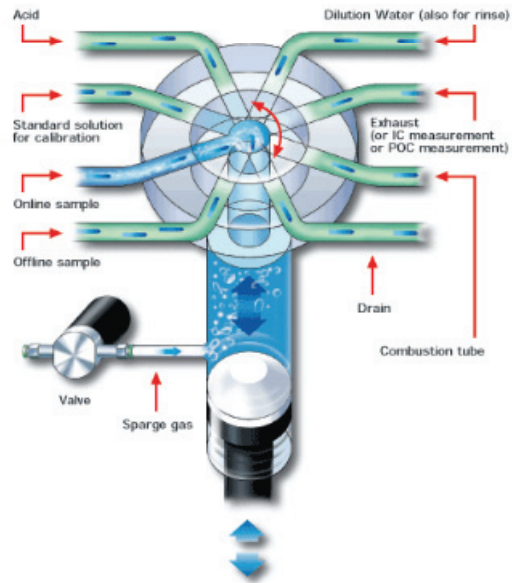
TOC-V CPH

This application can be easily carried out using TOC-V CPH. For a large number of samples the ASI-V autosampler, in which the samples are automatically acidified and sparged in the sample vials, is recommended. During TOC measurement of the first sample, the next sample is already being sparged in order to save valuable time. But even when an autosampler is not available, the NPOC method can still be automated.

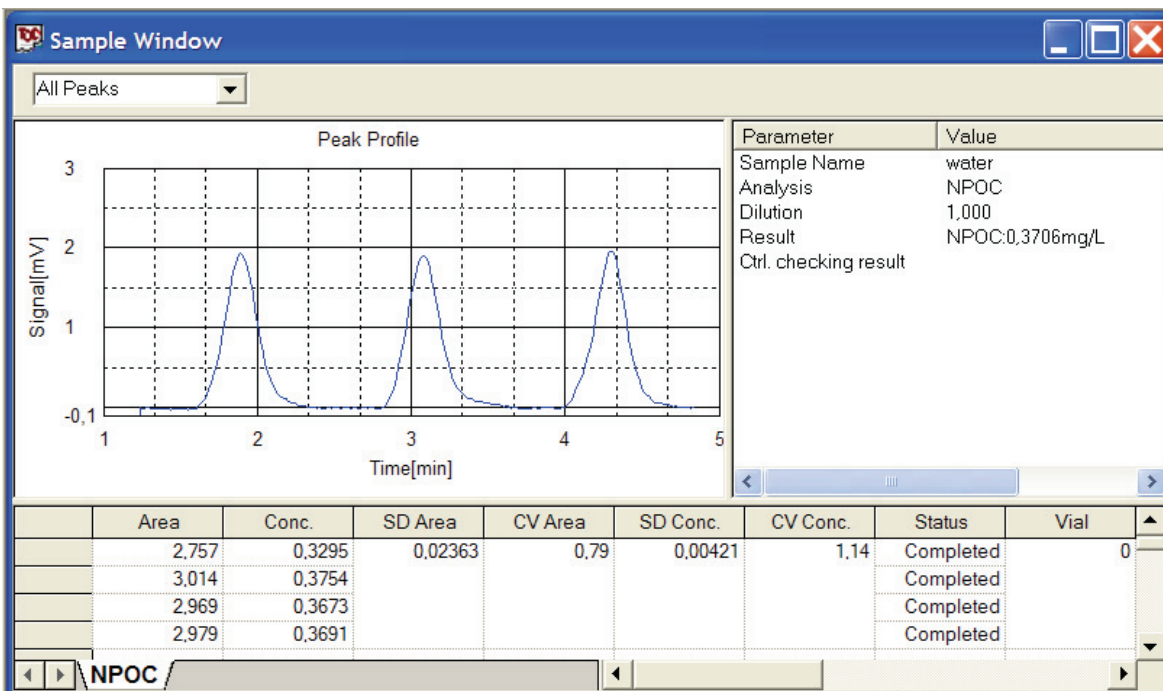
For a large number of samples are automatically acidified and sparged in the sample vials, is recommended. During the first sample measurement, the next sample is already being sparged in order to save valuable time. The high sample capacity of 93 vials (24mL) supports a high throughput.

Integrated Sample Pretreatment system (ISP)

The TOC-V series is equipped with an ISP (integrated sample preparation) module, which consists of an 8-port valve and a syringe with sparging gas connection.



In addition to acidification and sparging in the syringe, the ISP also enables automatic dilution. This feature facilitates an extended measuring range, dilution of highly contaminated samples and the preparation of a series of calibration samples from a stock solution. The ISP module can therefore considerably reduce time-consuming sample handling steps.



Sample window of TOC-Control V – Drinking water determination

The given specifications serve purely as technical information for the user. No guarantee is given on technical specification of the described product and/or procedures.