DATA BULLETIN

The analysis of low TOC concentrations in brine using the vario TOC cube

The analysis of saturated salt solutions (brine) strongly reduces the lifetime of the quartz glass combustion tube and the catalyst of a TOC analyzer. Due to the excellent matrix separation of the vario TOC cube, strong saline samples can be analyzed automatically over a long time without interruption for maintenance. Moreover, concentrations below 1 ppm provide no problems for the vario TOC cube since the matrix separation enables high injection volumes up to 0.5 ml.

The combustion tube temperature of the vario TOC cube is reduced to 680°C to avoid melting of the salt. Moreover, a closed-bottom ash finger (crucible) containing about 1 cm quartz wool is used, in which all salt residues are captured.

A 28% brine solution was prepared containing 2 ppm TOC and analyzed on the vario TOC cube over a long time period. The solution was diluted with water (1:10) before analysis.

28% BRINE (10 ANALYSES) TOC [mg/l]		AVERAGE TOC [mg/l]	SD [mg/l]	RSD [%]
2.237	2.176			
2.146	2.194			
2.319	2.146	2.204	0.071	3.23
2.267	2.297			
2.116	2.146			

Due to impurities in NaCl used for the preparation of the Brine solution, the measured TOC concentration is higher than the nominal value of 2 ppm.

By reducing the combustion tube temperature to 680°C and using a ash crucible containing quartz wool when analyzing brine samples, the alkaline residues of the sample do not come in contact with the combustion tube and catalyst. Due to this complete matrix separation, the vario TOC cube can be run with brine samples automatically for more than 100 samples when using an injection volume of 100 µl.

We recommend flushing the instrument with water (using the flush sequence function in the software) between brine samples for even more analyses without interruption.