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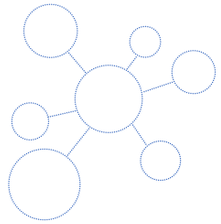
Technologies TOC versus COD



TOC (Total Organic Carbon)
Mainly used in water samples, but also in soil and air samples to determine the contamination by organic compounds.
Determination Methods:
Wet Chemical UV Oxidation:
The sample is treated with UV light and persulfate ions to oxidize organic substances to CO_2.
Catalytic Combustion:
The sample is burned at high temperatures on a catalyst.
Detection: The resulting CO_2 is usually detected using NDIR technology (non-dispersive infrared spectroscopy).

COD (Chemical Oxygen Demand)
Widely used in wastewater analysis to determine the pollution by organic substances.
Determination Method:
Dichromate Method: Oxidation of the sample with potassium dichromate in acidic solution at high temperature.
Photometric Determination: Measurement of the absorption of the remaining dichromate to determine the oxygen demand.

Technologies TOC versus COD

Both methods are of great importance in the industry but TOC measurement is currently showing a stronger trend towards integration into automated and continuous monitoring systems, especially in the pharmaceutical and water treatment industries.

COD measurement, however, remains indispensable for wastewater analysis and is evolving towards more environmentally friendly methods.

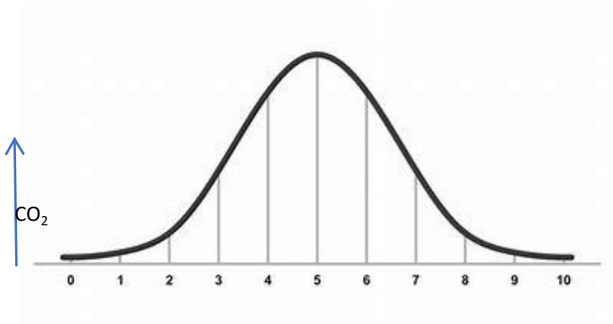
In our the focus as TOC sensor Customer

- Public Waste water as well as pottet water online analytic systems
- Industrie waste water control
- Laboratory water TOC Analyzer
- Airport Waste water control (Defreezing of planes)
- TOC Analyzer Manufacturer

Horiba „Tocadero one“ / Shimadzu „TOC-Lseries“ / Elementar „enviro TOC“ / Mettler-“Toledo TOC“ / Endress and Hauser „TOC CA72“ / GE Analytical Instruments „Sievers TOC“ / HACH „QBD1200+“ / Eltra „Elementrac“ / membraPure „uniTOC“ / xylem OI Analytical / a.s.o.

TOC (Total Organic Carbon)

The process of TOC analytic generates a gas flow where the CO_2 concentrantion at the geginning rised and to the end drop down to zero again. Best to explain by a gauss curve where the horizontal is the time and the vertical is the CO_2 concentration

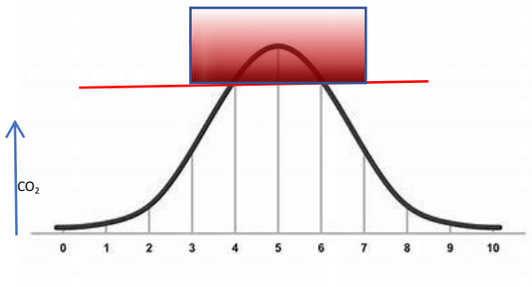


The resulting TOC level in the analyzed probe is proportional to the area(Integral) under the CO_2 concentration curve. Means as best the cuve will be determinated as best the measurement result of TOC is

TOC (Total Organic Carbon) basic requirements of CO_2 detection

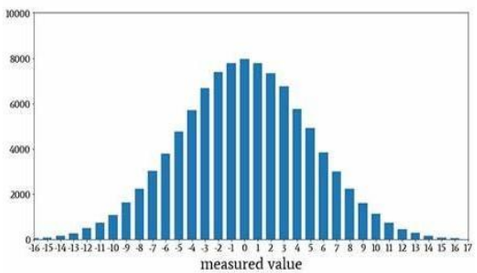
Processing the analytic emittes onely a little amount of CO_2 gas what is mixed with the carryer gas.
If the inner volume of sensor is huge, the resulting signal quality will be bad because of the gas exchange im in the volume of sensor.

Highly polluted sample will have a high peak CO_2 level.
If the measured range of the sensor is to small, the process will fail.
Same will happen if the T90 Time of the sensor is slow and the peak is very short.



Low polluted sample will have a low CO_2 concetration.
If the measuring range of the sensor is huge the error of sensor in the low range will rise the error of result until it can not be measured because it is only noise.
Same will happen if the noise sensor is high and the signal is very low.

If the read out time of sensor(frequence of data) is low, the curve will be like stairs and the calculated TOC will have a huge errror.



In additional a temperatur stable and pressure compensated sensor will enhance the qulaity or analytic result.

smartGAS CO2 Sensors for TOC Analytic

	Range	Volume	Data Rate	Noise (LDL)	Pressure Compesated	Temp.	
FLOW^{EVO}	One Range 0-100ppm up to 0-20000ppm	very low	high	low	no	compen-sated	Best fit sensor for analytic applications where the range of contamination is known and do not vary not much
FLOW^{EVO} Plus		very low	very high	very low	yes	highly stabi-lized ± 0,5K	Best fit sensor for high end analytic applications where the range of contamination is known and do not vary not much
SILAREX TOC	Three Ranges generate one signal 0-100ppm 0-1000ppm 0-10000ppm up to 0-25000ppm	very low	high	low in each range	yes	stabi-lized ± 2K	Best fit sensor for analytic applications where the range of contamination is not known and may vary from sample to sample
SILAREX TOC Plus		very low	very high	very low in each range	yes	highly stabi-lized ± 0,5 K	Best fit sensor for high end analytic applications where the range of contamination is not known may vary for each sample