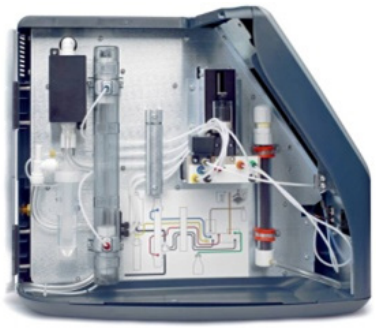
BECKMAN COULTER
Life Sciences

QbD1200+ Analyzer
Background Subtraction



When measuring a water sample to quantify Total Organic Carbon (TOC), most TOC Analyzers add some combination of reagents and dilution water to the initial sample in order to complete the measurement. These added reagents and dilution water are a potential source of TOC that need to be accounted for (subtracted) from the final measurement result to obtain an accurate TOC value for the sample. The QbD1200+ analyzer combines acid, oxidizer, and dilution water into a single reagent which makes this blank or background TOC subtraction simple and ensures a good TOC measurement of the sample. The QbD1200+ analyzer automatically performs these calculations.

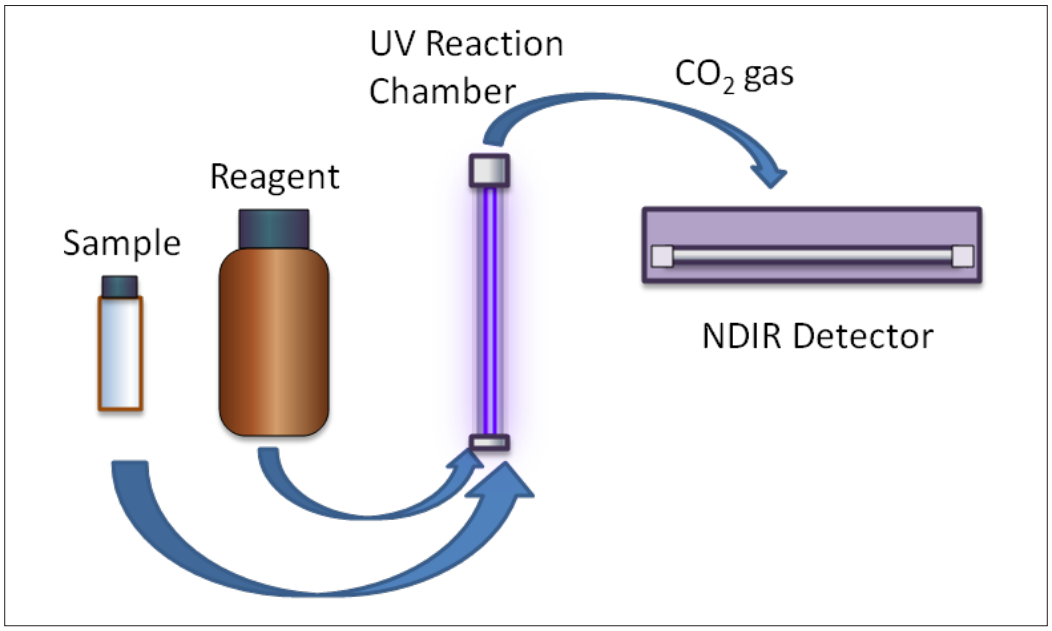
The measurement strategy must account for TOC from two sources:

1. The sample: contains an unknown concentration of TOC.
2. The reagent: contains a small amount of background TOC that is known after a background measurement is taken.

The Nondispersive Infrared (NDIR) detector will detect all CO_2 passing through it—some of this CO_2 may have originated from background carbon in the reagent. The QbD1200+ analyzer will automatically recommend that the user take a background measurement at the beginning of a run if there has not been a background measurement taken recently.

To understand this concept better, consider measuring a sample which has 100 ppb TOC:

- The first step the QbD1200+ analyzer will perform is an auto-range measurement which determines the ratio of sample to reagent that should be used during measurement.
- For a 100 ppb sample, this would result in combining 8 mL of sample with 2 mL of reagent.
- The NDIR sensor will count all CO_2 passing through it. This total count contains carbon that originated from both the sample and the reagent. The small concentration of carbon present in the 2 mL of reagent is subtracted and called “background”.
- When the background is known, the calculations can easily adjust based on how many mL of reagent are mixed with the sample.



Background TOC Notes:

- The QbD1200+ analyzer automatically prompts user to initiate background measurement at the beginning of a run if there has not been a recent background measurement taken.
- All calculations are automatic and handled by the QbD1200+ analyzer.
- One reagent is prepared by mixing 1-part stock solution with 100 parts pure water. The background measurement is taken on this reagent mixture.
- USP <643> specifies that all reagent water should be < 100 ppb TOC. The QbD1200+ analyzer background measurement automatically checks this.
- Careful consideration of background TOC ensures an accurate TOC measurement of unknown samples.

For Beckman Coulter's worldwide of f ice locations and phone numbers, please visit Contact Us at beckman.com

2022-GBL-EN-100685-v2