

## Application Note

# QbD1200

## BACKGROUND SUBTRACTION

When measuring a water sample to quantify 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 in the final measurement result to obtain an accurate TOC value for the sample.

The QbD1200 combines acid, oxidizer, and dilution water into a single reagent that makes this blank, or background, TOC subtraction simple and ensures a good TOC measurement of the sample. The QbD1200 automatically performs these calculations.



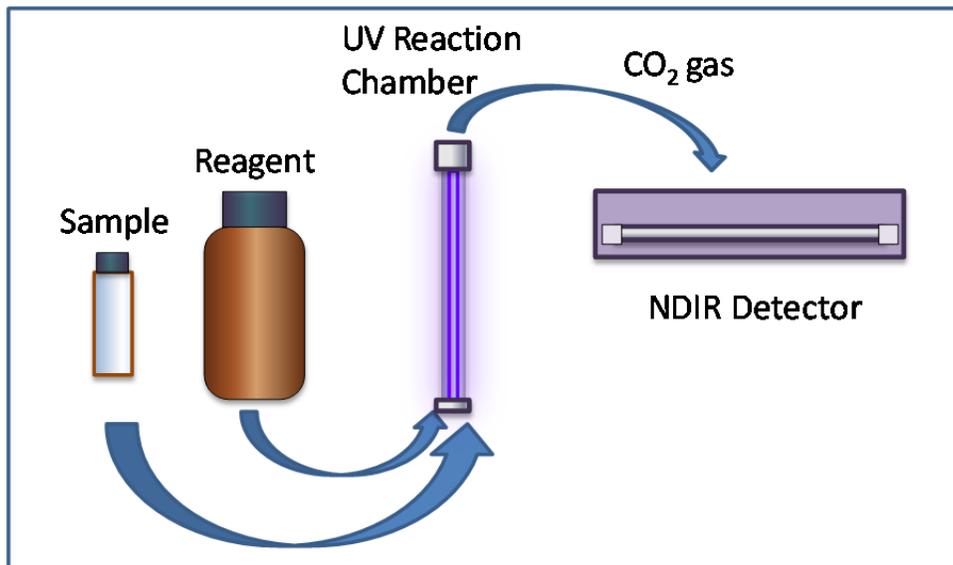
The measurement strategy must account for TOC from two sources:

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 NDIR will detect all CO<sub>2</sub> passing through it—some of this CO<sub>2</sub> may have originated from background carbon in the reagent. The QbD1200 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 that has 100ppb TOC:

- The first step the QbD1200 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 detector will count all CO<sub>2</sub> 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 be easily adjust based on how many mL of reagent are mixed with the sample.



#### Background TOC Notes:

- QbD1200 automatically prompts the user to initiate a background measurement at the beginning of a run if a recent background measurement has not been taken.
- All calculations are automatic and handled by the QbD1200.
- One reagent is prepared by mixing 1 part stock solution with 100 parts pure water. The background measurement is taken on this reagent mixture.
- Careful consideration of background TOC ensures an accurate TOC measurement of unknown samples.

#### FOR TECHNICAL ASSISTANCE, PRICE INFORMATION AND ORDERING:

Tel: 800-227-4224 | E-Mail: [techhelp@hach.com](mailto:techhelp@hach.com)

To locate the HACH office or distributor serving you, visit: [www.hach.com](http://www.hach.com)

LIT2180

© Hach Company, 2014. All rights reserved.

*In the interest of improving and updating its equipment, Hach Company reserves the right to alter specifications to equipment at any time.*