



Bromate in water and drinking water – Overview of the available methods

Information for Bromate analysis

Why is the analysis of Bromate so important?

Bromate may arise with ozone in drinking water treatment in the oxidation of bromide-containing waters. Bromates are carcinogenic, these substances in drinking water are undesirable and there are limits for drinking water in many countries. The WHO guideline for drinking water prescribes the threshold of 0.010 mg/l BrO_3^- (or 10 $\mu\text{g/l}$ BrO_3^-) as a maximum allowable concentration in drinking water. The same limit is also specified in the EU drinking water directive. Local regulations like in NA from EPA, and in other countries often have the same limits too.

Overview of Bromate applications for the various, by Merck / EMD offered photometer and spectrophotometers

Cat-No.	Instrument	Measuring range	95% Confidence interval	used cells	Evaporation step required	Name of the Bromate application
1730180001	Prove 600	0,5 – 20,0 $\mu\text{g/l}$ BrO_3^-	$\pm 0,5 \mu\text{g/l}$ BrO_3^-	100-mm rectangular cell	yes	Bromate ULR
		1,0 – 40,0 $\mu\text{g/l}$ BrO_3^-	$\pm 1,0 \mu\text{g/l}$ BrO_3^-	50-mm rectangular cell	yes	Bromate ULR
		2,5 – 100,0 $\mu\text{g/l}$ BrO_3^-	$\pm 2,5 \mu\text{g/l}$ BrO_3^-	100-mm rectangular cell	no	Bromate LR
		5,0 – 200,0 $\mu\text{g/l}$ BrO_3^-	$\pm 5,0 \mu\text{g/l}$ BrO_3^-	50-mm rectangular cell	no	Bromate LR
1730170001	Prove 300	1,0 – 40,0 $\mu\text{g/l}$ BrO_3^-	$\pm 1,0 \mu\text{g/l}$ BrO_3^-	50-mm rectangular cell	yes	Bromate ULR
		5,0 – 200,0 $\mu\text{g/l}$ BrO_3^-	$\pm 5,0 \mu\text{g/l}$ BrO_3^-	50-mm rectangular cell	no	Bromate LR
1730160001	Prove 100	1,0 – 40,0 $\mu\text{g/l}$ BrO_3^-	$\pm 1,0 \mu\text{g/l}$ BrO_3^-	50-mm rectangular cell	yes	Bromate ULR
		5,0 – 200,0 $\mu\text{g/l}$ BrO_3^-	$\pm 5,0 \mu\text{g/l}$ BrO_3^-	50-mm rectangular cell	no	Bromate LR
1007070001	Pharo 300	0,003 – 0,120 mg/l BrO_3^-	$\pm 0,003 \text{ mg/l}$ BrO_3^-	50-mm rectangular cell	yes	Bromate NOVA + Pharo
1007060001	Pharo 100					
1097510001	NOVA 60					
1097520001	NOVA 60A					



Application

Reagents and accessories:

See applications "Bromate in water and drinking water - ultra low range" or "Bromate in water and drinking water - low range" as well as "analytical quality assurance, standard for Bromate".

1. Preparation of reagent

All reagents are prepared as described in the application sheets.

2. Production of standard solutions

A solution with 1000 mg/l Bromate is produced according to the application "analytical quality assurance, standard for Bromate". Other concentrations are made by dilutions with water GR grade. The standard solution of 1000 mg/l BrO_3^- and the diluted solutions are stable for several months at room temperature.

3. Pre-calibrated methods

The Spectroquant® Spectrophotometer Prove 600, Prove 300 and Prove 100 are pre-calibrated with the Bromate method. Select the program can by entering the code 307 (ultra-low range) or called 308 (low range) and the Bromate analysis is directly available.

The same applies to the Spectroquant® NOVA photometer and Spectroquant® Pharo spectrophotometer. Bromate can be measured under method 195.

4. User recalibration of the method

If a recalibration is desired, we recommend the selection of 3 - 10 concentrations plus reagent blank, evenly spread over the desired measuring range.

Sample preparation and analysis are conducted as described in the respective application note. The detailed description on how to recalibrate the methods can be found in chapter 9.7.10 of the Prove instrument manual.

In Spectroquant® NOVA photometer and Spectroquant® Pharo spectrophotometers method 195 cannot be re-calibrated. If customers like to create an own calibration, we provide an Excel file for that. Here users take 3-10 concentrations of standards, measure them in the photometer and prepare the programming data with the Excel file for the photometer. Enter these data into a new, own created method. Call up this method and start the measurement.

An optimal quality of measurement results is ensured with the above described procedure. Typically, a recalibration is not required.

More information

Please see for more details her:

www.merckmillipore.com/bromate

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