

METHOD STATEMENT



Determinand:

Determination of Bromate

Matrix:

Sample Types: Raw, Potable, Surface and Ground waters.

Principle of Method:

This method uses Metrohm Compact IC Pro and associated accessories.

Detection of Bromate is obtained by applying an acidic solution of potassium iodide containing a catalytic amount of molybdenum (VI) where the bromate reacts with iodide to form tri-iodide ions in a post column reaction (PCR) step. The tri-iodide is then measured by UV detection at 352nm. The amount of tri-iodide is directly proportional to the quantity of bromate in the sample.

Sampling and Sample Preparation:

Samples are normally collected in 250 ml or 300 ml amber glass bottles. No special preservation is required

If analysis cannot be immediately undertaken, samples should be stored at a temperature of 1 - 5°C until the day of analysis. Samples should be warmed up to room temperature prior to analysis and analysed within 31 days of the sampling date.

Interferences

Any peak that co-elutes at the same time as Bromate.

Performance of Method:

Range of Application:

LOQ - 20 µg/l BrO₃

The analytical range may be extended by sample dilution. Samples with a concentration higher than that of the top standard of 20 µg/l should be diluted with deionised (Milli-Q) water.

Reporting Limit is 0.14 µg/l BrO₃

Limit of Quantification:

0.1383 µg/l BrO₃

Recoveries of Compounds, Bias and Uncertainty of measurement:

Sample type	Mean sample result (µg/l)	Mean sample spike result (µg/l)	Conc. of spike (µg/l)	Spike recovery (%)	Bias (%)	% Uncertainty
Soft- Langsett	0.002	10.190	10	101.9	-	±5.39
Medium-Coventry	1.189	10.042	8.6	102.9	-	±6.12
Hard-Elvington	0.316	10.177	9.6	102.7	-	±5.05
Borehole - Cowick	0.000	9.494	10	94.9	-	±8.00
Raw-Derwent / Elvington	0.0002	10.222	10	102.2	-	±4.78
Bottle water - Strathmore	0.000	9.938	10	99.4	-	±4.68
Bristol-	2.459	10.385	7.6	104.3	-	±7.90

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Sample type	Mean sample result ($\mu\text{g/l}$)	Mean sample spike result ($\mu\text{g/l}$)	Conc. of spike ($\mu\text{g/l}$)	Spike recovery (%)	Bias (%)	% Uncertainty
Littleton (hard)						
Spiked LOD sample	-	0.524	0.5	-	-	± 14.4
4 $\mu\text{g/l}$ Std	3.985	-	-	-	-0.38	± 3.16
16 $\mu\text{g/l}$ Std	16.021	-	-	-	0.13	± 1.67

References:

Metrohm user's instruction guides.

Metrohm Application Setup - Analysis of bromate in water samples