

BROMATE

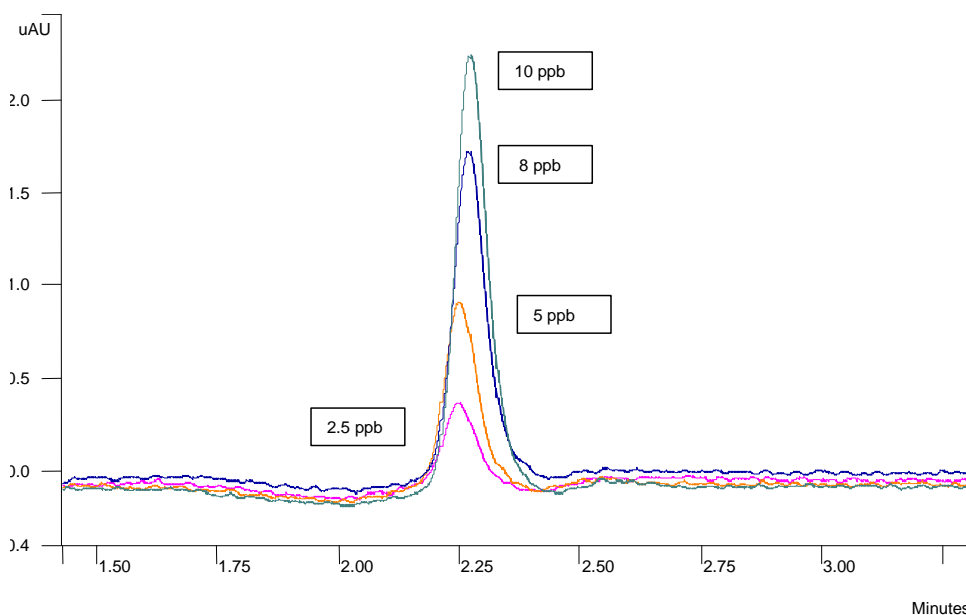


Bromate is a disinfection by-product that is formed when ozone reacts with naturally occurring bromide in drinking water. Bromate is a known animal carcinogen and also been listed as a group 2B toxin: probable human carcinogen. The U.S.EPA Method 300.1 employs conductivity as the means of detection which works well for most anions. However, the method is non-specific and coeluting interferences cannot be identified. The more recent EPA method 317.0 utilizes a bromate specific reagent in a post-column reaction. This allows for a very specific and sensitive (LOD about 1 ppb) assay for bromate in complex matrices.

Description of Method

Bromate reacts in a complex single-step reaction with the post-column reagents to form a dye that can be measured photometrically at 450 nm.

Chromatogram



Chromatogram of Bromate Standards



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APPLICATION NOTE

HPLC Conditions and Derivatization Parameters

| HPLC | |
|-----------------------------------|--|
| Operation Mode | Isocratic |
| Eluant | 9 mM sodium carbonate |
| Degassing | Helium- or vacuum-degassed |
| HPLC Column | Pickering anion exchange column, 4.6 x 150 mm |
| Column Oven | 42 °C |
| Flow Rate | 1.3 mL/min |
| Injection Volume | 250 µL |
| Post-Column Derivatization | |
| Pinnacle PCX | Single-pump; 500 µL reactor |
| Reactor Volume | 500 µL |
| Reactor Temperature | 60 °C |
| Reagent | Add 40 mL of 70 % HNO ₃ to 300 mL deionized water in a 500 mL volumetric flask. Dissolve 2.5 g KBr in this solution. Dissolve 250 mg of o-dianisidine dihydrochloride in 100 mL of methanol, add to the nitric acid/KBr solution, and dilute to volume. |
| Reagent Flow | 0.7 mL/min |
| Detection | |
| Detection Type | UV/VIS detection |
| UV/VIS | 450 nm |
| Flowcell | Analytic; pressure stable up to 7 bar |

APPLICATION NOTE

Literature

- 1) **U.S.EPA Method 317.0.** Determination of inorganic oxyhalide disinfection by-products in drinking water using ion chromatography with the addition of a post-column reagent for trace bromate analysis.
- 2) H.P.Wagner, B.V.Pepich, D.P.Hautman and D.J.Munch, J.Chromatography A, 882 (2000) 309 – 319.
- 3) C.R.Warner, D.H.Daniels, F.L.Joe and G.W.Diachenko, Food Additives and Contaminants, vol. 13, No.6 (1996) 633 – 638.

Order Information

| Order Number | Description |
|--------------|---|
| 1153-1022 | PINNACLE PCX; single-pump, 500 µL reactor |
| 0785150 | Anion exchange column, 4.6 x 150 mm |