METHOD #: 210.1	Approved for NPDES (Issued 1974)
TITLE:	Beryllium (AA, Direct Aspiration)
ANALYTE:	CAS # Be Beryllium 7440-41-7
INSTRUMENTATION:	AA
STORET No.	Total 01012 Dissolved 01010 Suspended 01011
Optimum Concentration Range:	0.05-2 mg/L using a wavelength of 234.9 nm
Sensitivity:	0.025 mg/L
Detection Limit:	0.005 mg/L

1.0 Preparation of Standard Solution

1.1 Stock solution: Dissolve 19.6558 g beryllium sulfate, $BeSO \cdot 4H_2O$ in deionized distilled water containing 2 mL conc. nitric acid and dilute to 1 liter. 1 mL = 1 mg Be (1000 mg/L).

1.2 Prepare dilutions of the stock solution to be used as calibration standards at the time of analysis. The calibration standards should be prepared using the same type of acid and at the same concentration as will result in the sample to be analyzed either directly or after processing.

2.0 Sample Preservation

2.1 For sample handling and preservation, see part 4.1 of the Atomic Absorption Methods section of this manual.

3.0 Sample Preparation

3.1 The procedures for preparation of the sample as given in parts 4.1.1 through 4.1.4 of the Atomic Absorption Methods section of this manual have been found to be satisfactory.

4.0 Instrumental Parameters (General)

4.1 Beryllium hollow cathode lamp
4.2 Wavelength: 234.9 nm
4.3 Fuel: Acetylene
4.4 Oxidant: Nitrous oxide
4.5 Type of flame: Fuel rich

5.0 Analysis Procedure

5.1 For analysis procedure and calculation, see "Direct Aspiration", part 9.1 of the Atomic Absorption Methods section of this manual.

6.0 Interferences

6.1 Sodium and silicon at concentrations in excess of 1000 mg/L have been found to severely depress the beryllium absorbance.

6.2 Bicarbonate ion is reported to interfere; however, its effect is eliminated when samples are acidified to a pH of 1.5.

6.3 Aluminum at concentrations of 500 μg/L is reported to depress the sensitivity of beryllium [Spectrochim Acta 22,1325 (1966)].

7.0 Notes

7.1 Data to be entered into STORET must be reported as μg/L.

7.2 The "aluminum colorimetric method" may also be used (Standard Methods, 14th Edition, p 177). The minimum detectable concentration by this method is 5 μg/L.

7.3 For concentrations of beryllium below 0.02 mg/L, the furnace procedure (Method 210.2) is recommended.

8.0 Precision and Accuracy

8.1 In a single laboratory (EMSL), using a mixed industrial-domestic waste effluent at concentrations of 0.01, 0.05 and 0.25 mg Be/L, the standard deviations were ± 0.001, ± 0.001 and ± 0.002,respectively. Recoveries at these levels were 1OO%, 98% and 97%, respectively.