

METHOD #: 219.1 Approved for NPDES (Editorial Revision 1978)

TITLE: Cobalt (AA, Direct Aspiration)

ANALYTE: CAS # Co Cobalt 7440-48-4

INSTRUMENTATION: AA

STORET No. Total 01037
Dissolved 01035
Suspended 01036

Optimum Concentration Range: 0.5-5 mg/L using a wavelength of 240.7 nm

Sensitivity: 0.2 mg/L

Detection Limit: 0.05 mg/L

1.0 Preparation of Standard Solution

1. Stock Solution: Dissolve 4.307 g of cobaltous chloride, $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$ (analytical reagent grade), in deionized distilled water. Add 10 mL of concentrated nitric acid and dilute to 1 liter with deionized distilled water. 1 mL = 1 mg Co (1000 mg/L).
2. Prepare dilutions of the stock cobalt 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

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

3.0 Sample Preparation

1. The procedures for preparation of the sample as given in parts 4.1.1 thru 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 Cobalt hollow cathode lamp
- 4.2 Wavelength: 240.7 nm
- 4.3 Fuel: Acetylene
- 4.4 Oxidant: Air
- 4.5 Type of Flame: Oxidizing

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 Notes

6.1 For levels of cobalt below 100 $\mu\text{g/L}$, either the Special Extraction Procedure, given in part 9.2 of the Atomic Absorption Methods section or the furnace technique, Method 219.2 is recommended.

6.2 Data to be entered into STORET must be reported as $\mu\text{g/L}$.

7.0 Precision and Accuracy

7.1 In a single laboratory (EMSL), using a mixed industrial-domestic waste effluent at concentrations of 0.20, 1.0 and 5.0 mg Co/L, the standard deviations were ± 0.013 , ± 0.01 and ± 0.05 , respectively. Recoveries at these levels were 98%, 98%, and 97%, respectively.