

METHOD #: 279.1 Approved for NPDES (Technical Revision 1978)

TITLE: Thallium (AA, Direct Aspiration)

ANALYTE: CAS # Tl Thallium 7440-28-0

INSTRUMENTATION: AA

STORET No. Total 01059
Dissolved 01057
Suspended 01058

Optimum Concentration Range: 1-20 mg/L using a wavelength of 276.8nm

Sensitivity: 0.5 mg/L

Detection Limit: 0.1 mg/L

1.0 Preparation of Standard Solution

- 1.1 Stock Solution: Dissolve 1.303 g of thallium nitrate, $TlNO_3$ (analytic reagent grade) in deionized distilled water. Add 10 mL of conc. nitric acid and dilute to 1 liter with deionized distilled water. 1 mL = 1 mg Tl (1000 mg/L).
- 1.2 Prepare dilutions of the stock thallium solution to be used as calibration standards at the time of analysis. The calibration standards should be prepared using nitric 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 The sample handling and preservations, 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 if HCl is omitted.

4.0 Instrumental Parameters (General)

- 4.1 Thallium hollow cathode lamp
- 4.2 Wavelength: 276.8 nm
- 4.3 Fuel: Acetylene
- 4.4 Oxidant: Air
- 4.5 Type of flame: Oxidizing

5.0 Analysis Procedure

- 5.1 For the analysis procedure and the calculation, see "Direct Aspiration", part 9.1

of the Atomic Absorption Methods section of this manual.

6.0 Notes

- 6.1 For concentrations of thallium below 0.2 mg/L, the furnace procedure, Method 279.2, 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 0.60, 3.0 and 15 mg Tl/L, the standard deviations were ± 0.018 , ± 0.05 and ± 0.2 , respectively. Recoveries at these levels were 100%, 98% and 98%, respectively.