**METHOD #: 273.1** Approved for NPDES (Editorial Revision 1974)

TITLE: Sodium (AA, Direct Aspiration)

ANALYTE: CAS # Na Sodium 7440-23-5

INSTRUMENTATION: AA

STORET No. Total 00929

Dissolved 00930 Suspended 00928

**Optimum Concentration Range:** 0.03-1 mg/L using a wavelength of 589.6 nm

### 1.0 Preparation of Standard Solutions

- 1.1 Stock Solution: Dissolve 2.542 g of NaCl (analytical reagent grade), dried at 140°C in deionized distilled water and make up to 1 liter. (1 mL = 1 mg Na (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 Method section of this manual.

### 3.0 Sample Preparation

- 3.1 For the analysis of total sodium in domestic and industrial effluents, the procedures for the determination of total metals as given in parts 4.1.3 and 4.1.4 of the Atomic Absorption Methods section of this manual have been found to be satisfactory.
- 3.2 For ambient waters a representative aliquot of a well-mixed sample may be used directly for analysis. If suspended solids are present in sufficient amounts to clog the nebulizer, the sample may be allowed to settle and the supernatant liquid analyzed directly.

#### 4.0 Instrumental Parameters (General)

- 4.1 Sodium hollow cathode lamp
- 4.2 Wavelength: 589.6 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 The 330.2 nm resonance line of sodium, which has a relative sensitivity of 185, provides a convenient way to avoid the need to dilute more concentrated solutions of sodium.
- 6.2 Low-temperature flames increase sensitivity by reducing the extent of ionization of this easily ionized metal. Ionization may also be controlled by adding potassium (1000 mg/L) to both standards and samples.
- 6.3 Data to be entered into STORET must be reported as mg/L.
- 6.4 The flame photometric method may also be used (Standard Methods, 14th Edition, p. 250).

# 7.0 Precision and Accuracy

7.1 In a single laboratory (EMSL), using distilled water samples spiked at levels of 8.2 and 52 mg Na/L, the standard deviations were  $\pm 0.1$  and  $\pm 0.8$ , respectively. Recoveries at these levels were 102% and 100%.