METHOD #: 206.3 Approved for NPDES and SDWA (Issued 1974)

TITLE: Arsenic (AA, Gaseous-Hydride)

ANALYTE: CAS # As Arsenic 7440-38-2

INSTRUMENTATION: AA

STORET No. Total 01002

Dissolved 01000 Suspended 01001

## 1.0 Scope and Application

1.1 The gaseous hydride method determines inorganic arsenic when present in concentrations at or above 2  $\mu$ g/L. The method is applicable to drinking water and most fresh and saline waters in the absence of high concentrations of chromium, cobalt, copper, mercury, molybdenum,nickel and silver.

## 2.0 Summary of Method

2.1 Arsenic in the sample is first reduced to the trivalent form using SnCl<sub>2</sub> and converted to arsine, AsH<sub>3</sub>, using zinc metal. The gaseous hydride is swept into an argon-hydrogen flame of an atomic absorption spectrophotometer. The working range of the method is 2-20  $\mu$ g/L . The 193.7 nm wavelength line is used.

#### 3.0 Comments

- 3.1 In analyzing drinking water and most surface and ground waters, interferences are rarely encountered. Industrial waste samples should be spiked with a known amount of arsenic to establish adequate recovery.
- 3.2 Organic forms of arsenic must be converted to inorganic compounds and organic matter must be oxidized before beginning the analysis. The oxidation procedure given in Method 206.5 (Standard Methods, 14th Edition, Method 404B, p. 285, Procedure 4.a) has been found suitable.
- 3.3 For sample handling and preservation, see part 4.1 of the Atomic Absorption Methods section of this manual.
- 3.4 For quality control requirements and optional recommendations for use in drinking water analyses, see part 10 of the Atomic Absorption Methods section of this manual.
- 3.5 Data to be entered into STORET must be reported as  $\mu$ g/L.

### 4.0 Precision and Accuracy

4.1 Ten replicate solutions of o-arsenilic acid at the 5, 10 and 20  $\mu$ g/L level were analyzed by a single laboratory. Standard deviations were  $\pm$  0.3,  $\pm$  0.9 and  $\pm$  1.1 with recoveries of 94, 93 and 85%, respectively. (Caldwell, J. S., Lishka, R.

J., and McFarren, E. F., "Evaluation of agwow Cost Arsenic and Selenium Determination at Microgram per Liter Levels", JAWWA., vol 65, p 731, Nov., 1973.)

# 5.0 References

5.1 Except for the perchloric acid step, the procedure to be used for this determination is found in: Standard Methods for the Examination of Water and Wastewater, 14th Edition, p 159, Method 301A(VII), (1975).