



National Institute of Standards & Technology

# Certificate of Analysis

## Standard Reference Material® 350a

Benzoic Acid  
(C<sub>6</sub>H<sub>5</sub>COOH)

This Standard Reference Material (SRM) consists of highly purified benzoic acid and is intended for use in acidimetric standardization. SRM 350a is provided in a unit consisting of 30 g.

Acidimetric Assay: 99.9958 ± 0.0027 Wt %

The above cited uncertainty represents the 95 percent confidence interval for the mean of replicate certification assays, with 11 degrees of freedom.

**Homogeneity:** The material in this lot of benzoic acid is homogeneous within the bounds of the random error uncertainty of the measurement process. Stereo and polarized light microscopic examination of SRM 350a revealed no fluid inclusions or particulate contamination.

**Expiration of Certification:** The certified purity of SRM 350a is valid for 5 years from date of shipment from NIST when stored under normal laboratory conditions.

**Source of Material:** This lot of benzoic acid was prepared by MCB Manufacturing Chemists, Inc., Cincinnati, OH.

*This Certificate of Analysis has undergone editorial revision to reflect program and organizational changes at NIST and the Department of Commerce. No attempt was made to reevaluate the certificate values or any other technical data presented on this certificate.*

The experimental sequence was developed by K.R. Eberhardt of the NIST Statistical Engineering Division who also statistically evaluated the results. Analytical measurements were performed by G. Marinenko of the NIST Analytical Chemistry Division. The microscopic examination was made by E.B. Steel of the NIST Analytical Chemistry Division.

The technical and support aspects involved in the original certification and issuance of this SRM were coordinated through the Standard Reference Materials Program by R.W. Seward. Revision of this certificate was coordinated through the Standard Reference Materials Program by J.C. Colbert.

Gaithersburg, MD 20899  
March 14, 1995  
(Revision of certificate dated 4-27-81)

Thomas E. Gills, Chief  
Standard Reference Materials Program

(over)

**Coulometric Assay:** The certified assay of SRM 350a is based on the absolute coulometric reduction of hydrogen ion in 1-g samples of the benzoic acid. The coulometric procedure used in this analysis has been described in reference [1].

The assay is based on 122.1232 as the molecular weight of benzoic acid and  $96486.5 \text{ A}\cdot\text{s}\cdot\text{mol}^{-1}$  as the Faraday constant. Corrections for the effect of the buoyancy of air were applied using the value  $1.320 \text{ g}\cdot\text{cm}^{-3}$  for the density of benzoic acid. The electrochemical equivalent of this lot of benzoic acid was determined to be  $1.265756 \pm 0.000034 \text{ mg/coulomb}$  where the uncertainty figure represents the 95% confidence interval for the mean based on 11 degrees of freedom. In the statistically designed experiment, six bottles of SRM 350a were randomly selected from the entire lot and were assayed in duplicate.

**Drying Instructions:** It has been established that benzoic acid will not absorb moisture from the atmosphere if the relative humidity does not exceed 90 percent. However, during the course of certification, the material was stored over anhydrous magnesium perchlorate in a desiccator as a precautionary measure.

#### REFERENCE

- [1] Marinenko, G. and Taylor, J.K., Electrochemical Equivalents of Benzoic and Oxalic Acid, *Anal. Chem.*, **40**, 1645 (1968).