



National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material[®] 1543

GC/MS System Performance Standard

This Standard Reference Material (SRM) is intended primarily for use in evaluating the sensitivity of gas chromatography/mass spectrometry (GC/MS) instrumentation. A unit of SRM 1543 consists of four solutions: two concentrations of methyl stearate in hexane and two concentrations of benzophenone in hexane.

Certified Concentrations of Constituents: The certified concentration values and estimated uncertainties given below are based on gravimetric values from the preparation of the solutions and on analytical values determined by gas chromatography. These values are valid between 18 °C and 28 °C. No evidence of sample heterogeneity was observed. A NIST certified value is a value for which NIST has the highest confidence in its accuracy in that all known or suspected sources of bias have been investigated or taken into account [1].

Certified Mass Concentration Values for SRM 1543

Compound	Concentration ^(a) (ng/μL)
Methyl Stearate (low)	0.99 ± 0.02
Methyl Stearate (high)	4.98 ± 0.08
Benzophenone (low)	1.01 ± 0.02
Benzophenone (high)	5.01 ± 0.07

^(a) The certified values, expressed as the value ± the expanded uncertainty, are valid between 18 °C and 28 °C. The certified value is the average of the concentrations determined by gravimetric and chromatographic measurements. The expanded 95 % uncertainty uses a coverage factor of 2 and includes correction for estimated purity, allowance for differences between the concentration determined by gravimetric preparation and chromatographic measurements, and an allowance for the use of this SRM between 18 °C and 28 °C [2]. The measurand is the mass concentration for each compound listed. Metrological traceability is to the SI derived unit for mass concentration (expressed as nanograms per microliter).

Expiration of Certification: The certification of **SRM 1543** is valid indefinitely, within the uncertainty specified, until **31 May 2036**, provided the SRM is handled and stored in accordance with the instructions given in this certificate (see "Instructions for Handling, Storage, and Use"). The certification is nullified if the SRM is damaged, contaminated, or otherwise modified.

Maintenance of SRM Certification: NIST will monitor this SRM over the period of its certification. If substantive technical changes occur that affect the certification, NIST will notify the purchaser. Registration (see attached sheet or register online) will facilitate notification.

Coordination of the technical measurements leading to the certification of this SRM was performed by B.A. Benner, Jr. of the NIST Chemical Sciences Division.

Preparation and analytical measurements of the SRM were performed by J.M. Brown-Thomas, R.G. Christensen, L.R. Hilpert, R.E. Rebbert, and L.T. Sniegowski of the NIST Chemical Sciences Division.

Statistical analysis of the data was performed by R.C. Paule of the former NBS National Measurement Laboratory.

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Steven J. Choquette, Acting Director
Office of Reference Materials

Support aspects involved in the issuance of this SRM were coordinated through the NIST Office of Reference Materials.

INSTRUCTIONS FOR HANDLING, STORAGE, AND USE

Handling: This material should be handled with care. Use proper disposal methods.

Storage: Sealed ampoules, as received, should be stored in the dark at temperatures between 10 °C and 30 °C.

Use: Ampoules should be brought to a temperature between 18 °C and 28 °C before opening. Sample aliquots for analysis should be withdrawn **immediately** after opening the ampoules and should be processed without delay for the certified values to be valid within the stated uncertainty. The volume used should be at least 0.1 µL, and a syringe appropriate to the volume to be measured should be chosen. Care should be taken to minimize evaporation of the solvent. Because storage conditions may affect the concentration, certified values are not applicable to material stored after opening even if stored in resealed containers.

REFERENCES

- [1] May, W.; Parris, R.; Beck, C.; Fassett, J.; Greenberg, R.; Guenther, F.; Kramer, G.; Wise, S.; Gills, T.; Colbert, J.; Gettings, R.; MacDonald, B.; *Definitions of Terms and Modes Used at NIST for Value-Assignment of Reference Materials for Chemical Measurements*; NIST Special Publication 260-136, U.S. Government Printing Office: Washington, DC (2000); available at <http://www.nist.gov/srm/upload/SP260-136.PDF> (accessed July 2016).
- [2] JCGM 100:2008; *Evaluation of Measurement Data – Guide to the Expression of Uncertainty in Measurement* (GUM 1995 with Minor Corrections); Joint Committee for Guides in Metrology (JCGM) (2008); available at http://www.bipm.org/utis/common/documents/jcgm/JCGM_100_2008_E.pdf (accessed July 2016); see also Taylor, B.N.; Kuyatt, C.E.; *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*; NIST Technical Note 1297; U.S. Government Printing Office: Washington, DC (1994); available at <http://www.nist.gov/pml/pubs/index.cfm> (accessed July 2016).

Certificate Revision History: 28 July 2016 (Change of expiration date; editorial changes); 15 August 1984 (Original certificate date).

Users of this SRM should ensure that the Certificate of Analysis in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srminfo@nist.gov; or via the Internet at <http://www.nist.gov/srm>.