



National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material[®] 1482a

Polyethylene

This Standard Reference Material (SRM) is intended primarily for use in calibration and performance evaluation of instruments used to determine the molecular mass and molecular mass distribution by high temperature size exclusion chromatography (SEC) and instruments used to obtain the high temperature dilute solution viscosity of the polymer. SRM 1482a is supplied in the form of a white powder in units of 0.3 g.

Property	Certified Value and Uncertainty
Certified Mass-Average Molecular Mass (M_w):	13 600 g/mol \pm 1 500 g/mol
Certified Number-Average Molecular Mass (M_n):	11 400 g/mol \pm 300 g/mol
Certified Intrinsic Viscosity [η]:	40.1 mL/g \pm 0.57 mL/g

Certified Measurement Technique and Uncertainty: The M_w , M_n and their related combined expanded uncertainties reported above were measured on SRM 1482 *Polyethylene* in 1978 [1,2].

Intrinsic viscosity measurements were made at 130 °C in the solvent, 1,2,4-trichlorobenzene. Butylated hydroxytoluene (2,6-Di-*tert*-butyl-4-methylphenol) was added to the solvent at about 0.7 g/L as an antioxidant. Details of the intrinsic viscosity measurements on SRM 1482a are given in reference [3].

All certified measurement uncertainties are expressed as combined expanded uncertainties with a coverage factor $k = 2$.

Expiration of Certification: The certification of SRM 1482a is valid, within the measurement uncertainties specified, until **22 November 2012**, provided that the SRM is handled in accordance with the instructions given in this certificate. This certification is nullified if the SRM is modified or contaminated.

Maintenance of Certification: NIST will monitor representative solutions from this SRM lot over the period of its certification. If substantive changes occur that affect the certification before the expiration of certification, NIST will notify the purchaser. Registration (see attached sheet) will facilitate notification.

Technical measurement and data interpretation were provided by C.M. Guttman, J.R. Maurey and W.R. Blair of the NIST Polymers Division.

The support aspects involved in the issuance of this SRM were coordinated through the NIST Standard Reference Materials Program by C.S. Davis of the Measurement Services Division.

Eric J. Amis, Chief
Polymers Division

Gaithersburg, MD 20899
Certificate Issue Date: 22 March 2005
See Certificate Revision History on Last Page

Robert L. Watters, Jr., Chief
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Homogeneity and Characterization: The homogeneity of SRM 1482a was tested by SEC analysis of solutions in 1,2,4-trichlorobenzene at 130 °C. The characterization of this polymer is described in reference [3]. SRM 1482a is a reblending and rebottling of SRM 1482.

Storage: The SRM should be stored in the original bottle with the lid tightly closed under normal laboratory conditions.

REFERENCES

- [1] Wagner H.L.; Verdier, P.H.; *The Characterization of Linear Polyethylene SRM's 1482, 1483, and 1484 II; Number-Average Molecular Weights by Membrane Osmometry*; J. Res. Natl. Bur. Stand., Vol. 83, No. 2, pp. 179–184 (1978).
- [2] *Standard Reference Materials: The Characterization of Linear Polyethylene SRM's 1482, 1483, and 1484*; NISR Special Publication 260-61, pp. 169–201 (1978).
- [3] Han, C.C.; Verdier P.H.; Wagner, H.L.; *The Characterization of Linear Polyethylene SRMs 1482, 1483, and 1484 III; Number-Average Molecular Weights by Light Scattering*; J. Res. Natl. Bur. Stand., Vol. 83, No. 2, pp. 185–193 (1978).
- [4] Guttman, C.M.; Blair, W.R.; Maurey, J.R.; *Recertification of the SRM 1482a, a Polyethylene*; NISTIR 6054, pp. 1–13 (1997).

Certificate Revision History: 22 March 2005 (This revision reflects an extension in the certification period and editorial changes); 04 December 1997(Original certificate date).

Users of this SRM should ensure that the certificate in their possession is current. This can be accomplished by contacting the SRM Program at: telephone (301) 975-6776; fax (301) 926-4751; e-mail srminfo@nist.gov; or via the Internet <http://www.nist.gov/srm>.