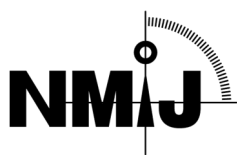


National Institute of Advanced Industrial Science and Technology

## National Metrology Institute of Japan



## Reference Material Certificate

NMIJ CRM 8110-a  
No. +++

## Polybrominated Diphenyl Ethers in Polystyrene (High Concentration)

This certified reference material (CRM) is produced in accordance with the NMIJ's management system and is in compliance with ISO 17034 and ISO/IEC 17025. This CRM is intended for use in controlling the precision of analysis or confirming the validity of analytical methods or instruments during the analysis of decabromodiphenyl ether (DBDE) in polystyrene.

**Certified Value**

The certified value for DBDE in this CRM is given in the table below. The uncertainty of the certified value is the half-width of the expanded uncertainty interval calculated using a coverage factor ( $k$ ) of 2, which gives a level of confidence of approximately 95 %.

	CAS No.	Certified value, Mass fraction (mg/kg)	Expanded uncertainty, Mass fraction (mg/kg)
Decabromodiphenyl Ether	1163-19-5	886	28

**Analysis**

The certified value of this CRM was weighted mean of the results of the following analytical methods:

- 1) Gas chromatograph - mass spectrometry (isotope dilution method)
- 2) High performance liquid chromatography (HPLC, standard addition method)

**Metrological Traceability**

The certified value was determined by two analytical methods of measurements with a purified DBDE as the primary standard whose purity was determined at National Metrology Institute of Japan (NMIJ).

**Expiration of Certification**

This certificate is valid for one year from the date of shipment, provided that the material is stored in accordance with the instructions given in this certificate.

**Sample Form**

This CRM is in the form of a clear disk at room temperature. The diameter, thickness and mass of the disk are about 30 mm, 2 mm and 1.45 g, respectively. Five disks are packed in an aluminum-laminated plastic bag.

**Homogeneity**

The homogeneity of this CRM was evaluated by X-ray fluorescence spectrometry from the intensity out from center, e.g. 1 cm diameter, of the disk. 10 disks were picked up at almost equal intervals of their production out of 3288 disks and were used for the homogeneity testing. The homogeneity is reflected in the uncertainty of the certified value.

**Instructions for Storage**

This CRM should be kept in the aluminum-laminated plastic bag and should be stored at a temperature between 5 °C and 35 °C in a dark place.

**Instructions for Use**

Do not touch this CRM with bare hands to prevent from contamination. Considering the homogeneity, use the one entire disk for analysis.

**Precautions for Handling**

Do not use this standard substance for testing/research purposes only. Pay attention to fire and ventilation; wear protective mask, protective gloves, etc. DBDE is designated as Class 1 Designated Chemical Substances in the Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. It is also designated as Class I Designated Chemical Substances in the Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof (PRTR law). Handle in compliance with these laws. Refer to the safety data sheet (SDS) on this CRM before use.

**Preparation**

This CRM was prepared by Chemical Evaluation and Research Institute, Japan (CERI). Polystyrene resin and DBDE were mixed and extruded, and then disks were made by injection molding.

**Technical Information**

The mass fraction of total Br in this CRM was 751 mg/kg at the time of certification. It was estimated from the certified value of this CRM and the composition of the flame retardant added to this CRM determined by HPLC.

**NMIJ Analysts**

The technical managers for this CRM are KINUGASA S. and SAITO T., the production manager is MATSUYAMA S., and the analysts are MATSUYAMA S., ORIHARA Y., KISHINE K., and KINUGASA S.

**Information**

If substantive technical changes occur that affect the certification before the expiration of this certificate, NMIJ will notify the registered customer. Customer registration on the NMIJ Website (given below) will facilitate notification. Technical reports regarding this CRM can be obtained from the contact details given below.

**Reproduction of Certificate**

In reproducing this certificate, it should be clearly indicated that the document is a copy.

**Note**

The purity of the primary standard was validated in an international comparison in Asian collaboration on reference materials (ACRM).

This CRM was a result of the project aided from the New Energy and Industrial Technology Development Organization (NEDO) in 2005.

April 1, 2020

ISHIMURA Kazuhiko  
President

National Institute of Advanced Industrial Science and Technology

If you have any questions about this CRM, please contact:  
National Institute of Advanced Industrial Science and Technology,

National Metrology Institute of Japan,  
Center for Quality Management of Metrology, Reference Materials Office,  
1-1-1 Umezono, Tsukuba, Ibaraki 305-8563, Japan  
Phone: +81-29-861-4059; Fax: +81-29-861-4009, <https://unit.aist.go.jp/nmij/english/refmate/>

Revision history

August 10, 2012: The expiration of this certificate was extended from “March 31, 2013” to “March 31, 2018.”

April 1, 2015: “Metrology Management Center” was renamed to “Center for Quality Management of Metrology.”

February 21, 2017: The description in “Expiration of Certification” was changed to “one year from the date of shipment.”

Sample

## Instruction of attachment

### Polystyrene

This polystyrene attached to NMIJ CRM 8110-a was made from polystyrene resin used for the matrix of NMIJ CRM 8110-a. This polystyrene resin was made by injection molding with same production condition of NMIJ CRM 8110-a. This polystyrene was not mixed with decabromodiphenyl ether.  
Storage condition is same as the NMIJ CRM 8110-a.

#### **Appendix**

This polystyrene was a result of the project aided from the New Energy and Industrial Technology Development Organization (NEDO) in 2005.

If you have any questions about this CRM, please contact:  
National Institute of Advanced Industrial Science and Technology,  
National Metrology Institute of Japan,  
Center for Quality Management of Metrology, Reference Materials Office,  
1-1-1 Umezono, Tsukuba, Ibaraki 305-8563, Japan  
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