National Institute of Advanced Industrial Science and Technology

National Metrology Institute of Japan

Reference Material Certificate
NMIJ CRM 4407-a01

Hexane in methane

This certified reference material (CRM) was produced in accordance with the NMIJ’s management system and in compliance with ISO GUIDE 34:2009 and ISO/IEC 17025:2005. This CRM is intended for use in the calibration of instruments.

Certified Value
The certified value for hexane 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%.

<table>
<thead>
<tr>
<th>Hexane (n-Hexane)</th>
<th>CAS No.</th>
<th>Certified value Amount-of-substance fraction (µmol/mol)</th>
<th>Expanded uncertainty Amount-of-substance fraction (µmol/mol)</th>
<th>Cylinder number</th>
</tr>
</thead>
<tbody>
<tr>
<td>110-54-3</td>
<td>509.1</td>
<td>2.3</td>
<td>CPC00286</td>
<td></td>
</tr>
</tbody>
</table>

Analysis
The certified value is the amount-of-substance fraction calculated in accordance with ISO 6142-1:2015 which specifies the gravimetric method. The uncertainty was evaluated by taking account of the uncertainties derived from weighing, molar masses, purities of source gas and raw material, stability, residual pressure in the cylinder, and the verification method using a gas chromatograph equipped with a flame ionization detector.

Metrological Traceability
This CRM was prepared by the gravimetric method at NMIJ using a mass comparator and weights that were traceable to the International System of Units (SI). The source gas and the raw material whose purities were traceable to the SI were used. The certified value, therefore, is traceable to the SI.

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

Sample Form
This CRM is in the form of colorless gas at room temperature and standard pressure. This CRM is delivered in an aluminum alloy cylinder with an inner volume of approximately 9.5 L. The specification of the cylinder outlet is W22-14-threads right. The pressure in the cylinder of this CRM is above 4 MPa (35 °C).

Instructions for Storage
This CRM should be stored in compliance with high-pressure gas regulations and other relevant laws. This CRM should not be exposed to sunlight. This CRM is flammable gas and, therefore, should be stored at a temperature of 0 °C to 40 °C in a well-ventilated area. The cylinder containing this CRM should be held with chains at its top and bottom parts to prevent it from falling. Refer to the safety data sheet (SDS) on this CRM for details.
Instructions for Use
This certificate is valid when residual pressure of the cylinder of this CRM is kept at 1.5 MPa or more in terms of gauge pressure. It is recommended to sufficiently displace residual gas in a regulator, valves, piping systems, measuring instruments, and other relevant apparatuses of this CRM before use. To avoid contamination of the environment, it is recommended to check leakage from the joints of piping systems.

Precautions for Handling
This CRM should be handled in accordance with high-pressure gas regulations. This CRM is flammable gas and, therefore, should not be handled in the presence of open flames. This CRM is a simple asphyxiant that should only be handled at a temperature of 0 °C to 40 °C in a well-ventilated area. Care should be taken to the presence of flames and the leakage of this CRM. This CRM should be returned to Center for Quality Management of Metrology of AIST after use or after the expiry date. Refer to the SDS on this CRM before use.

Preparation
This CRM was prepared from commercially-available high-purity hexane and methane by NMIJ by using a gravimetric method in accordance with ISO 6142-1:2015.

NMIJ Analysts
The technical manager for this CRM is T. Shimosaka, the production manager is T. Watanabe, and the analysts are T. Watanabe and K. Takada.

Information
If substantive technical changes occur that affect the certification before the expiration of this certificate, NMIJ will notify the registered customers. 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.

***** xx, 2019

Ryoji Chubachi
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://www.nmij.jp/english/service/C/