National Institute of Advanced Industrial Science and Technology

National Metrology Institute of Japan

Reference Material Certificate

NMIJ CRM 6024-a
No. +++

L-Histidine

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 primarily intended for the calibration of analytical instruments, preparation of standard solutions, and validation of analytical methods and instruments used for the amino acid analysis.

Certified Values

The certified value for the purity (in mass fraction) of L-histidine is given in the table below. The uncertainty of the certified value is the expanded uncertainty obtained by multiplying the combined standard uncertainty by a coverage factor (k) of 2, and it is the half-width of an interval estimated to have a level of confidence of approximately 95 %.

Substance	CAS No.	Certified value, Mass fraction (kg/kg)	Expanded uncertainty, Mass fraction (kg/kg)
L-Histidine ((2*S*)-2-amino-3-(1*H*-imidazol-5-yl) propanonic acid)	71-00-1	0.999	0.002

The purity (in mass fraction) of histidine without enantiomeric separation is given in the table below, where the mass fraction of D-histidine is negligible. The uncertainty of the certified value is the expanded uncertainty obtained by multiplying the combined standard uncertainty by a coverage factor (k) of 2, and it is the half-width of an interval estimated to have a level of confidence of approximately 95 %.

Substance	Certified value, Mass fraction (kg/kg)	Expanded uncertainty, Mass fraction (kg/kg)
Histidine (without enantiomeric separation)	0.999	0.002

Analysis

The certified value is based on the results of acidimetric titration, nitrogen determination by the Kjeldahl method and impurity determination by high performance liquid chromatography (HPLC). Impurities of amino acids were identified and quantified by HPLC with fluorescence detection after derivatization using *o*-phthalaldehyde (OPA) and liquid chromatography-mass spectrometry (LC/MS).

Metrological Traceability

The certified value was determined by titrimetry as the primary method of measurement with NMIJ CRM 3001-a (potassium hydrogen phthalate) and NMIJ CRM 3005-a (sodium carbonate) as primary standards and by impurity determination using HPLC calibrated with purity-evaluated amino acids. It is traceable to the International System of Units (SI).

Mutual Recognition Arrangement under Meter Convention

The certified value and expanded uncertainty of this CRM without enantiomeric separation (mass fraction) is recognized for

international equivalence based on the Mutual Recognition Arrangement under the Metre Convention (CIPM MRA). The calibration measurement capability (CMC) of NMIJ related to this CRM is registered in the Key Comparison Database (KCDB) (see https://www.bipm.org/kcdb/) of the International Bureau of Weights and Measures (BIPM).

Expiration of Certification

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

Description of the material

This CRM is in the form of a white powder of L-Histidine. This CRM of 0.5 g in net volume is kept in a brown glass vial and the vial is sealed in an aluminum-laminated plastic bag.

Instructions for Storage

This CRM should be stored at a temperature between 15 °C and 25 °C in a clean desiccator and shielded from light.

Instructions for Use

From the homogeneity, a minimum sample mass of 95 mg should be used. The CRM is for laboratory use only and not for in vivo use. The CRM should be used promptly once the vial is opened.

Precautions for Handling

Refer to the safety data sheet (SDS) on this CRM before use.

Preparation

Preparation of the material was performed by Wako Pure Chemical Industries, Ltd. Highly purified L-histidine provided by AJINOMOTO Co., Inc. was bottled into vials under argon atmosphere. Each vial was sealed in an aluminum-laminated bag.

Technical Information

Impurity of amino acid over 0.1 g/kg was not detected at the time of certification.

NMIJ Analysts

The technical manager for this CRM is TAKATSU A. and production manager is YAMAZAKI T. The analysts are YAMAZAKI T., KATO M., EYAMA S. and YOSHIOKA M.

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.

April 1, 2020

ISHIMURA Kazuhiko
President
National Institute of Advanced Industrial Science and Technology

If you have any questions about this CRM, please contact:
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Phone: +81-29-861-4059; Fax: +81-29-861-4009, https://unit.aist.go.jp/nmij/english/refmate/

Revision history
April 1, 2015: "Metrology Management Center" was renamed to "Center for Quality Management of Metrology."
January 28, 2019: The description on "Mutual Recognition Arrangement under Meter Convention" was added.
September 30, 2021: The description in "Expiration of Certification" was changed to "one year from the date of shipment."