Date of Shipment: Xxxxx xx, 20xx

6024b00-230626-230626

National Institute of Advanced Industrial Science and Technology

National Metrology Institute of Japan

Reference Material Certificate

NMIJ CRM 6024-b

No. +++

L-Histidine

Sample

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 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. 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 %.

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

Analysis

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

(1) Acidimetric titration corrected the bias due to the amount of amino acid-related impurities

(2) Nitrogen determination by Kjeldahl method corrected the bias due to the amount of amino acid-related impurities

Amino acid-related impurities were identified and quantified by HPLC with fluorescence detection after derivatization using *o*-phthalaldehyde (OPA). D-histidine was determined by the LC/MS using a chiral resolution column.

Metrological Traceability

The certified value was determined by titrimetry which was one of the primary method of measurement with NMIJ CRM 3001-c (potassium hydrogen phthalate) or NMIJ CRM 3012-a (tris(hydroxymethyl)aminomethane) and by amino acid-related impurity determination using HPLC calibrated with purity-evaluated amino acids. The certified values , therefore, is traceable to the International System of Units (SI).

Mutual Recognition Arrangement under Metre Convention

The certified value 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 (capabilities) (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 this CRM 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 and 1 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

Considering the homogeneity, a minimum sample mass of 63 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 FUJIFILM Wako Pure Chemical Corporation. Highly purified L-histidine produced by AJINOMOTO Co., Inc. was bottled into vials under argon atmosphere. Each vial was sealed in an aluminum-laminated bag.

Technical Information

At the time of certification, more than 0.1 g/kg amino acid-related impurities were not detected. The molar mass of histidine used to calculate the certified value is 155.155 g/mol.

NMIJ Analysts

The technical manager for this CRM is KATO M., the production manager is MIYAMOTO A., and the analysts are MIYAMOTO A. and EYAMA S.

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.

Sample

June 26, 2023

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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National Metrology Institute of Japan,
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