

National Institute of Advanced Industrial Science and Technology
National Metrology Institute of Japan



Reference Material Certificate

NMIJ CRM 6017-b

No. +++

L-Arginine



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-arginine 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-Arginine (<i>(S)</i> -2-amino-5-guanidinopentanoic acid)	74-79-3	0.999	0.002

The purity (in mass fraction) of arginine 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)
Arginine (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). D-arginine was determined by the LC/MS using a chiral resolution column.

Metrological Traceability

The certified value was determined by titrimetry as the primary method of measurement with NMIJ CRM 3001-b (potassium hydrogen phthalate) or 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).

Date of Shipment: Xxxxx xx, 20xx

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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 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- arginine. 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

Considering the homogeneity, a minimum sample mass of 22 mg should be used. The CRM is for laboratory use only and not for *in vivo* use. Because of the hygroscopicity of the material, it should be used under dry conditions. Opening and usage under the low humidity (less than 40 % at 25 °C) are strongly recommended. The CRM should be well mixed with the lid on, before vial is opened, and 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- arginine provided 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, moisture was determined by Karl Fischer coulometric titration to be 0.19 g/kg, however it is gradually increasing. More than 0.1 g/kg amino acid-related impurities were not detected.

NMIJ Analysts

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

Date of Shipment: Xxxxx xx, 20xx

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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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Sample