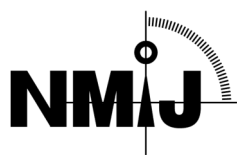


National Institute of Advanced Industrial Science and Technology

## National Metrology Institute of Japan



## Reference Material Certificate

NMIJ CRM 6402-b  
No. +++



## Aldosterone in Human Serum (3 Concentration Levels)

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 primarily for use in calibration of analytical instruments as well as evaluation of their accuracy and validation of analytical procedures or instruments for determination of aldosterone in human serum through instrumental analysis. In addition, this CRM can be used in evaluation of the accuracy of the immunoassay of the aldosterone analysis and validation of relevant analytical instruments and quantitative values, after the commutability has been verified by the user.

**Certified Values**

The certified values for mass concentration of aldosterone at 25 °C are given in the following table. 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 %.

	Aldosterone (CAS: 52-39-1)	
	Certified value Mass concentration (pg/mL)	Expanded uncertainty Mass concentration (pg/mL)
Level 1	197	21
Level 2	383	42
Level 3	760	40

**Analysis**

The certified value is based on the results of isotope dilution liquid chromatography tandem mass spectrometry (ID-LC-MS/MS). Mass concentration was calculated from mass fraction of aldosterone obtained in the ID-LC-MS/MS measurement and density of this CRM.

**Metrological Traceability**

The certified value was determined by isotope dilution mass spectrometry (IDMS) as a primary method of measurement and density of this CRM. The solution to calibrate IDMS was prepared with the aldosterone standard, whose purity was assessed by the mass balance method. The density was determined by a vibration-type density meter calibrated by the JCSS-Accredited Density Standard Liquid. The certified values, therefore, are traceable to the International System of Units (the SI).

**Indicative Values**

The indicative values for samples of Levels 1 to 3, expressed as mass fractions, are given in the following table. The uncertainty of the certified value is the half width of the expanded uncertainty interval calculated by using a coverage factor ( $k$ ) of 2, which gives a level of confidence of approximately 95 %.

	Aldosterone	
	Indicative Value Mass fraction (pg/g)	Expanded uncertainty Mass fraction (pg/g)
Level 1	193	21
Level 2	374	41
Level 3	742	39

### Mutual Recognition Arrangement under Meter Convention

The certified value of this CRM is consistent with the calibration and measurement capabilities (CMCs) that are included in Appendix C of the Mutual Recognition Arrangement (MRA) drawn up by the International Committee for Weights and Measures (CIPM). Under the MRA, all participating institutes recognize the validity of each other's calibration and measurement certificates for the quantities, ranges and measurement uncertainties specified in Appendix C (as for Appendix C of MRA, see

<https://kcdb.bipm.org/AppendixC/default.asp>).

### Expiration of Certification

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

### Sample Form

This CRM is in the form of yellow liquid. The CRM of 0.5 mL was bottled in each vial.

### Homogeneity

The homogeneity of this CRM was determined by analyzing 10 vials selected from among the total 150 vials. The homogeneity has been incorporated in the uncertainties of the certified values.

### Instructions for Storage

This CRM should be kept at temperatures below  $-20^{\circ}\text{C}$  and protected from light.

### Instructions for Use

About one hour prior to use, the CRM to be analyzed should be removed from a freezer and left at temperatures of  $20^{\circ}\text{C}$  to  $25^{\circ}\text{C}$  until it thaws. After confirming the cap of the vial is tightly closed, the vial should be turned upside down gently several times for homogenization. The CRM, after thawing, should be used up immediately. Storing the thawed material may result in changes in the aldosterone concentration. For this CRM, the specificity of the analytical method cannot be evaluated because it was prepared with charcoal treatment.

### NOTICE AND WARNINGS TO USERS

NMIJ CRM 6402-b IS INTENDED FOR IN-VITRO LABORATORY USE ONLY. THIS IS A HUMAN SOURCE MATERIAL. HANDLE THIS CRM AS A BIOHAZARDOUS MATERIAL CAPABLE OF TRANSMITTING INFECTIOUS DISEASES. The supplier of this material has reported that serum material used in the preparation of this CRM has been tested and found non-reactive/negative for hepatitis B surface antigen, hepatitis C virus, and human immunodeficiency virus antigen. However, no known test methods can offer complete assurance that hepatitis B virus, hepatitis C virus, HIV, or other infectious agents are absent from this material. Accordingly, this human blood-based product should be handled with due care recommended for any POTENTIALLY INFECTIOUS HUMAN SERUM.

### Preparation

This CRM was prepared by Reference Material Institute for Clinical Chemistry Standards (Kanagawa, Japan). The serum material used was processed according to Clinical Laboratory Standards Institute (CLSI) Publication C37-A [1]. The base

serum sample was prepared by mixing several serum samples containing low-concentration aldosterone. Serum sample with high concentration of aldosterone was prepared by adding a small amount of aldosterone in ethanol to the base serum. Serum samples with aldosterone of three different concentrations were prepared by mixing the base serum and the serum sample with high concentration of aldosterone at a proper ratio.

[1]"Preparation and Validation of Commutable Frozen Human Serum Pools as Secondary Reference Materials for Cholesterol Measurement Procedures; Approved Guideline", NCCLS Publication C37-A, Clinical Laboratory Standard Institute.

#### Technical Information

The density of this CRM was 1.02356 g/cm<sup>3</sup> for Level 1 sample and 1.02357 g/cm<sup>3</sup> for Level 2 and Level 3 samples.

#### NMIJ Analysts

The technical and production manager for this CRM are KATO M. and the analysts are KAWAGUCHI M. 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.

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/refimate/>

## Annex: NMIJ CRM 6402-b Aldosterone in Human Serum

This CRM package contains one vial of base serum sample, which is a raw material for Certified Reference Material of Aldosterone in Human Serum (CRM 6402-b). The base serum sample is labeled as “base serum”. The mass concentration of aldosterone for this base serum sample is not certified. The base serum sample should be handled according to [Instructions for Use] and [NOTICE AND WARNINGS TO USERS] in the certificate.

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/>

Sample