

National Institute of Advanced Industrial Science and Technology

## National Metrology Institute of Japan



### Reference Material Certificate

NMIJ CRM 3008-a

No. +++

Sodium Chloride



This certified reference material (CRM) was produced based on NMIJ's management system in compliance with ISO GUIDE 34:2009 and ISO/IEC 17025:2005, and can be used to standardize titrants for argentometry, and to control the precision of analysis or to confirm the validity of analytical methods or instruments during analysis of chloride ion.

#### Certified Values

The certified values of this CRM are given in the following table. The quoted uncertainty 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 %.

	Certified value, Mass fraction (%)	Expanded uncertainty, Mass fraction (%)
Purity expressed as sodium chloride for argentometry	100.001	0.045
Purity expressed as sodium chloride for analysis of chloride ion	100.000	0.045

#### Analytical Methods

The certified value was determined by analyzing 10 bottles which were chosen by a stratified random sampling with the order of bottling. The purity expressed as sodium chloride for argentometry was determined by argentometric coulometric titration, and that for analysis of chloride ion was calculated from correction of the foregoing purity with mass fractions of bromide ion and iodide ion, which were determined by ion chromatography. The molar mass of sodium chloride (58.4413) was calculated from the IUPAC atomic weight table (2009). The value  $96\,485.336\,5\text{ C mol}^{-1}$  was used for the Faraday constant (CODATA:2010). The value  $2.17\text{ g cm}^{-3}$  (25 °C) was used as the density of sodium chloride for air-buoyancy correction.

#### Metrological Traceability

Each certified value was determined by argentometric coulometric titration as a primary method of measurements and is traceable to the International System of Units (SI).

#### Expiration of Certification

The certification of this CRM is valid until March 31, 2018, provided that the material is unopened and stored in accordance with the instructions given in this certificate.

#### Sample Form

This CRM is white powder in a glass bottle (net mass 50 g).

#### Homogeneity

The homogeneity of the CRM was determined by analyzing 10 bottles which were chosen by a stratified random sampling with the order of bottling. The purities were determined by argentometric coulometric titration. The homogeneity is reflected to the uncertainty of the certified value.

[This document is just explanation translated from the original Japanese certificate and some information is omitted from it.]

### **Precautions for Storage**

This CRM should be kept at temperature (15 °C to 35 °C) and at relative humidity 60 % or less shielded from light. Careful attention should be paid to this material being a deleterious substance.

### **Precautions for Use**

It should be dried for two hours at 600 °C without crushing and then stood at room temperature for one hour in a desiccator with silica gel. The use of samples of mass less than 0.2 g is not recommended.

### **Preparation Method**

The source material of this CRM was purchased from Wako Pure Chemical Industries, Ltd.

### **Reference Information**

The mass fraction of bromide ions were determined as 20.4 mg kg<sup>-1</sup> (the expanded uncertainty calculated using a coverage factor (*k*) of 2 was 3.1 mg kg<sup>-1</sup>) by ion chromatography. Iodide ions were not observed and the detection limit was 1.2 mg kg<sup>-1</sup>. This CRM dried at 110 °C for 3 hours and assayed a purity of 99.89 % mass fraction by argentometric coulometric titration.

### **NMIJ Analysts**

The technical manager for this CRM is T. Miura, the production manager and the analyst is T. Suzuki.

### **Technical Information**

Customer registration on the NMIJ WEB site shown below will facilitate notification of above revision. Technical report about this CRM can be also obtained from the contact shown below.

### **Reproduction of Certificate**

In reproducing this certificate, it should be clearly indicated that the document is a copy.

March 27, 2013

Tamotsu Nomakuchi  
President

National Institute of Advanced Industrial Science and Technology

If you have any questions about this CRM, please contact  
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