Issue no.:Sample

Lot.BU

Issue date:20**y**m**d

ASNITE 0052-R

The General Environmental Technos Co., Ltd.

Certificate of Analysis

Certified Reference Material

KANSO CRM Lot.BU

Reference Material for Nutrients in Seawater (RMNS)

This certified reference material (CRM) was produced using treated natural seawater on the basis of quality control system under JIS Q 0034 (ISO GUIDE 34), for use in managing analysis precision or verifying performance of analytical methods or instruments for analysis of nutrients in seawater or matrices similar to seawater.

１． Name and Location of the Manufacturer/Analysis Facility

The General Environmental Technos Co., Ltd.

Laboratory for Instrumentation and Analysis

3-1-1, Higashikuraji, Katano, Osaka, 576-0061, Japan

２． Name of Reference Material and Sample Form

Name: Reference Material for Nutrients in Seawater (RMNS)

Sample: About 90 mL of this CRM solution in a 100 mL polypropylene bottle (vacuum-sealed in aluminum-film bag).

３． Certified Values

The certified values of 4 types of nutrients are shown in the table below. The expanded uncertainty in the table represents combined standard uncertainty calculated using a coverage factor of 2 which gives approximately 95 % level of confidence. The standard deviation (SD) of between-bottle is calculated based on the results of 180 bottles measured in duplicates, following JIS Q 0035 guideline.

	Certified Value (µmol/kg)	Expanded Uncertainty (µmol/kg)	Between-Bottle SD (µmol/kg)	Analysis Method
Nitrate	3.937	0.051	0.019	Colorimetric method in Japan Meteorological Agency's Manual on Oceanographic Observation (1999); Cu-Cd reduction Naphthylethylene-diamine photometric method
Nitrite	0.072	0.0059	0.0024	Colorimetric method in Japan Meteorological Agency's Manual on Oceanographic Observation (1999); Naphthylethylenediamine photometric method
Silicate	20.92	0.49	0.23	Colorimetric method in Japan Meteorological Agency's Manual on Oceanographic Observation (1999); Molybdenum blue method
Phosphate	0.345	0.0085	0.0027	Colorimetric method in Japan Meteorological Agency's Manual on Oceanographic Observation (1999); Molybdenum blue method

４． Value Determination

The certified values were arithmetic means of the results of 30 bottles each (measured in duplicates) analyzed by the General Environmental Technos Co., Ltd. and Japan Agency for Marine-Earth Science and Technology (JAMSTEC) with colorimetric method (continuous flow mode).

５． Traceability

Each certified value of nitrate, nitrite, and phosphate was determined by one of Japan Calibration Service System (JCSS) standard solutions for each nitrate ions, nitrite ions, and phosphate ions. Silicate value was determined by one of Merck KGaA silicon standard solution 1000 mg/L Si traceable to National Institute of Standards and Technology (NIST) silicon standard reference material (SRM) 3150. The salinity of calibration solutions used in continuous flow analysis (CFA) method were adjusted to the salinity of this CRM ± 0.5 psu. National Metrology Institute of Japan (NMIJ) CRMs were analyzed with this CRM and the results were confirmed within uncertainty.

６． Raw Material and Processing Method

Collected location: (1) Pacific Ocean (32 ºN, 144 ºE); surface seawater.
(2) Suruga Bay, Japan; 397 meters depth.

Raw seawater was filtered (0.45 µm membrane filter), 73 % of seawater (1) and 27 % of seawater (2) were mixed by weight ratio, autoclave treatments (2 sets of 120 ºC for 2 h) conducted, and about 90 mL aliquots of treated seawater were transferred into 100 mL polypropylene bottles in a Class 10000 clean room. (No additives)

７． Intended Use

Seawater nutrient reference material solution for nutrients analysis. (Do not use for other purposes)

８． Storage and Usage Specifications

Do not freeze (the composition of the product may change).

Store at room temperature below 40 ºC.

Because of no additives or preservatives, the quality is not ensured for reuse after opening the outer seal.

Do not dilute or concentrate the product.

Shake well and open the seal right before use.

When sampling the product, do not insert objects to prevent contamination.

９． Certified Date

2015/6/18

１０． Production Date

2011/4/26

１１． Expiration and Guarantee Date

Under unopened and stored condition described in section 8, this CRM’s expiration and guarantee date is 2018/4/25

１２． Homogeneity

Out of 2500 bottles produced, 6 sets, each set consisting of randomly selected 30 bottles were analyzed (total of 180 bottles analyzed). The level of homogeneity was assessed from the results and confirmed acceptable homogeneity. Uncertainty associated with sample homogeneity is reflected in the uncertainties of the certified values. The standard deviations of between-bottle for 180 bottles analyzed are given in the table in section 3.

１３． Additional Information

(1) Salinity **34.538 psu** (standard deviation 0.0004 psu; n = 10)

An electrical conductivity measurement method in Japan Meteorological Agency's Manual on Oceanographic Observation (1999) was used to measure salinity.

１４． Health and Safety

Do not eat or drink the product.

Because the product is seawater, generally, it can be disposed by diluting; however, follow local jurisdictions when carrying out the disposal procedure.

１５． Limitations of Copied Certificate

When copying this certificate, make clear indication as such in the copied certificate.

１６． Technical Information

The buyer of this CRM shall be notified when changes in property values and/or any important changes are made in relation to this product. For more technical information, contact us at the address or webpage below.

１７． Name and Signature of Party Responsible for Production and Certification

The General Environmental Technos Co., Ltd.

Laboratory for Instrumentation and Analysis

Director: Masanobu KATAGIRI

For any inquiry, please contact us

KANSOテクノス

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