

Prep Standard - Chemical Standard Summary

Order ID : Q2842

Test : Alkalinity,Anions Group1,TDS

Prepbatch ID :

Sequence ID/Qc Batch ID: LB136803,LB136835,LB136847,

Standard ID :

WP112796,WP114185,WP114186,WP114187,WP114188,WP114189,WP114190,WP114191,WP114192,WP114193,WP
114194,WP114265,WP114266,WP114305,WP114306,

Chemical ID :

M6157,W2647,W3058,W3112,W3150,W3163,W3178,W3180,W3197,W3217,



<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
4035	IC ELUENT CONCENTRATE FOR IC-1	WP112796	04/22/2025	10/22/2025	Iwona Zarych	WETCHEM_SCALE_5 (WCS)	None	Jignesh Parikh 04/22/2025
<u>FROM</u> 2.10000gram of W2647 + 84.75000gram of W3163 + 913.15000ml of W3112 = Final Quantity: 1000.000 ml								

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
2487	Anions 300/9056 calibration standard 1	WP114185	08/06/2025	08/06/2026	Iwona Zarych	None	None	Jignesh Parikh 08/21/2025
<u>FROM</u> 10.00000ml of W3112 = Final Quantity: 10.000 ml								



<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
24	Anions 300/9056 calibration standard 2	WP114186	08/06/2025	08/07/2025	Iwona Zarych	None	WETCHEM_PIPETTE_3	Jignesh Parikh
(WC)								
<u>FROM</u>	0.20000ml of W3180 + 9.80000ml of W3112 = Final Quantity: 10.000 ml							

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
25	Anions 300/9056 calibration standard 3	WP114187	08/06/2025	08/07/2025	Iwona Zarych	None	WETCHEM_FIPETTE_3	Jignesh Parikh
(WC)								
<u>FROM</u>	0.40000ml of W3180 + 9.60000ml of W3112 = Final Quantity: 10.000 ml							

Wet Chemistry STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
26	Anions 300/9056 calibration standard 4	WP114188	08/06/2025	08/07/2025	Iwona Zarych	None	WETCHEM_F IPETTE_3 (WC)	Jignesh Parikh 08/21/2025
FROM 0.50000ml of W3180 + 9.50000ml of W3112 = Final Quantity: 10.000 ml								

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
3680	Anions 300/9056 calibration standard 5-CCV	WP114189	08/06/2025	08/07/2025	Iwona Zarych	None	WETCHEM_F IPETTE_3 (WC)	Jignesh Parikh 08/21/2025
FROM 45.00000ml of W3112 + 5.00000ml of W3180 = Final Quantity: 50.000 ml								

Wet Chemistry STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
3679	Anions 300/9056 calibration standard 6	WP114190	08/06/2025	08/07/2025	Iwona Zarych	None	WETCHEM_F IPETTE_3 (WC)	Jignesh Parikh 08/21/2025
FROM 2.00000ml of W3180 + 8.00000ml of W3112 = Final Quantity: 10.000 ml								

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
3681	Anions 300/9056 calibration standard 7	WP114191	08/06/2025	08/07/2025	Iwona Zarych	None	WETCHEM_F IPETTE_3 (WC)	Jignesh Parikh 08/21/2025
FROM 2.50000ml of W3180 + 7.50000ml of W3112 = Final Quantity: 10.000 ml								



<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
3233	Anions 300/9056 ICV-LCS std	WP114192	08/06/2025	08/07/2025	Iwona Zarych	None	WETCHEM_PIPETTE_3	Jignesh Parikh
(WC)								
<u>FROM</u>	45.00000ml of W3112 + 5.00000ml of W3197 = Final Quantity: 50.000 ml							

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
4036	IC ELUENT FOR IC-1	WP114193	08/06/2025	09/06/2025	Iwona Zarych	None	Glass Pipette-A	Jignesh Parikh 08/21/2025
<u>FROM</u> 1980.00000ml of W3112 + 20.00000ml of WP112796 = Final Quantity: 2000.000 ml								

Wet Chemistry STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
4037	IC H2SO4 FOR IC-1	WP114194	08/06/2025	09/06/2025	Iwona Zarych	None	Glass Pipette-A	Jignesh Parikh 08/21/2025

FROM 5.60000ml of M6157 + 994.40000ml of W3112 = Final Quantity: 1000.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
3233	Anions 300/9056 ICV-LCS std	WP114265	08/13/2025	08/14/2025	Eman Mughal	None	Glass Pipette-A	Jignesh Parikh 08/21/2025

FROM 45.00000ml of W3112 + 5.00000ml of W3197 = Final Quantity: 50.000 ml

Wet Chemistry STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
3680	Anions 300/9056 calibration standard 5-CCV	WP114266	08/13/2025	08/14/2025	Eman Mughal	None	Glass Pipette-A	Jignesh Parikh 08/21/2025

FROM 45.00000ml of W3112 + 5.00000ml of W3180 = Final Quantity: 50.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
3407	Acidity-Alkalinity Stock Std(-+2500PPM)	WP114305	08/15/2025	08/22/2025	Eman Mughal	WETCHEM_S CALE_5 (WC SC-5)	None	Jignesh Parikh 08/21/2025

FROM 0.62500gram of W3058 + 249.40000ml of W3112 = Final Quantity: 250.000 ml

Wet Chemistry STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
293	alkalinity LCSW 50 ppm	WP114306	08/15/2025	08/22/2025	Eman Mughal	None	WETCHEM_F IPETTE_3 (WC)	Jignesh Parikh 08/21/2025
FROM 196.00000ml of W3112 + 4.00000ml of WP114305 = Final Quantity: 200.000 ml								

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9673-33 / Sulfuric Acid, Instra-Analyzed (cs/6c2.5L)	24i1262013	11/07/2025	05/07/2025 / RUPESH	02/18/2025 / Mohan	M6157

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	J3506-5 / SODIUM BICARBONATE, PWD, ACS, 2.5KG	0000240594	06/03/2026	02/24/2020 / AMANDEEP	01/20/2020 / apatel	W2647

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	EM-SX0395-3 / SODIUM CARBONATE ANHYDR 2.5KG	2023012653	10/19/2028	09/03/2024 / jignesh	10/19/2023 / lwona	W3058

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	DIW / DI Water	Daily Lab-Certified	07/03/2029	07/03/2024 / lwona	07/03/2024 / lwona	W3112

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	AL74050-8 / SULFURIC ACID, 0.02N, 4L	235420	03/31/2029	11/04/2024 / lwona	11/04/2024 / lwona	W3150

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	EM-SX0395-3 / SODIUM CARBONATE ANHYDR 2.5KG	24E3156178	09/30/2027	12/10/2024 / lwona	12/10/2024 / lwona	W3163

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	AL14055-3 / PH 4 BUFFER SOLUTION	2411A93	10/30/2026	04/01/2025 / JIGNESH	01/27/2025 / jignesh	W3178

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	300-CAL-A-500ML / 300.0 Calibration Standard, 500 ml	V2-MEB742616	02/19/2026	02/19/2025 / lwona	01/27/2025 / lwona	W3180

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Inorganic Ventures	300-CAL-A-500ML / 300.0 Calibration Standard, 500 ml	040525	04/05/2027	04/08/2025 / lwona	04/08/2025 / lwona	W3197

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	AL14455-3 / buffer solution pH 7 yellow	2504D34	03/31/2027	07/02/2025 / jignesh	06/26/2025 / lwona	W3217

Sodium Bicarbonate, Powder
BAKER ANALYZED® A.C.S. Reagent

(sodium hydrogen carbonate)



Material No.: 3506-05
Batch No.: 0000240594
Manufactured Date: 2019/06/05
Retest Date: 2026/06/03
Revision No: 1

Certificate of Analysis

Meets ACS Reagent Chemical Requirements,

Test	Specification	Result
Assay (NaHCO ₃) (dried basis)	99.7 – 100.3 %	100.1
Insoluble Matter	<= 0.015 %	< 0.002
Chloride (Cl)	<= 0.003 %	0.003
Phosphate (PO ₄)	<= 0.001 %	0.001
Sulfur Compounds (as SO ₄)	<= 0.003 %	0.003
Calcium (Ca)	<= 0.02 %	0.02
Trace Impurities – Iron (Fe)	<= 0.001 %	0.001
Magnesium (Mg)	<= 0.005 %	0.005
Potassium (K)	<= 0.005 %	0.005
Ammonium (NH ₄)	<= 5 ppm	5
Trace Impurities – ACS – Heavy Metals (as Pb)	<= 5 ppm	5

For Laboratory, Research or Manufacturing Use
Meets Reagent Specifications for testing USP/NF monographs

Country of Origin: US
Packaging Site: Paris Mfg Ctr & DC

James Ethier
Jamie Ethier
Vice President Global Quality

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700
Avantor Performance Materials, LLC
100 Matsonford Rd, Suite 200, Radnor, PA 19087. U.S.A. Phone: 610.386.1700

Certificate Of Analysis



W 3058

Re. 10/19/23 12

Date of Release: 1/27/2023

Name: **Sodium Carbonate, Anhydrous**

Powder, ACS

Item No: **SX0395 All Sizes**

Lot / Batch No: **2023012653**

Country of Origin: **India**

Item	Specifications	Analysis
Assay (calculated on dried substance)	99.5% min.	100.2%
Calcium (Ca)	0.03% max.	0.004%
Chloride (Cl)	0.001% max.	<0.001%
Color	White	Passes Test
Form	Powder	Passes Test
Heavy metals (by ICP-OES)	5 ppm max.	<5 ppm
Insoluble Matter	0.01% max.	0.003%
Iron (Fe)	5 ppm max.	<5 ppm
Loss on heating at 285C	1.0% max.	0.1%
Magnesium (Mg)	0.005% max.	0.0008%
Phosphate (PO ₄)	0.001% max.	<0.001%
Potassium (K)	0.005% max.	0.003%
Silica (SiO ₂)	0.005% max.	<0.005%
Sulfur compounds (as SO ₄)	0.003% max.	<0.003%

Joe Schoellkopf

Quality Control Manager

This document has been produced electronically and is valid without a signature.

EMD Millipore is a division of Merck KGaA, Darmstadt, Germany

EMD Millipore Corporation

400 Summit Drive
Burlington, MA 01803
U.S.A.

Form number: 00005624CA, Rev. 2.0

Sulfuric Acid
BAKER INSTRA-ANALYZED® Reagent
For Trace Metal Analysis
Low Selenium

avantor™



MG157
MS

Material No.: 9673-33

Batch No.: 24I1262013

Manufactured Date: 2024-08-07

Retest Date: 2029-08-06

Revision No.: 0

Certificate of Analysis

Test	Specification	Result
ACS – Assay (H ₂ SO ₄)	95.0 – 98.0 %	96.2 %
Appearance	Passes Test	Passes Test
ACS – Color (APHA)	<= 10	5
ACS – Residue after Ignition	<= 3 ppm	<1 ppm
ACS – Substances Reducing Permanganate(as SO ₂)	<= 2 ppm	<2 ppm
Ammonium (NH ₄)	<= 1 ppm	<1 ppm
Chloride (Cl)	<= 0.1 ppm	<0.1 ppm
Nitrate (NO ₃)	<= 0.2 ppm	0.1 ppm
Phosphate (PO ₄)	<= 0.5 ppm	<0.1 ppm
Trace Impurities – Aluminum (Al)	<= 30.0 ppb	<5.0 ppb
Arsenic & Antimony (as As)	<= 4.0 ppb	<2.0 ppb
Trace Impurities – Boron (B)	<= 10.0 ppb	<5.0 ppb
Trace Impurities – Cadmium (Cd)	<= 2.0 ppb	<1.0 ppb
Trace Impurities – Chromium (Cr)	<= 6.0 ppb	<1.0 ppb
Trace Impurities – Cobalt (Co)	<= 0.5 ppb	<0.3 ppb
Trace Impurities – Copper (Cu)	<= 1.0 ppb	<1.0 ppb
Trace Impurities – Gold (Au)	<= 10.0 ppb	<5.0 ppb
Heavy Metals (as Pb)	<= 500.0 ppb	<100.0 ppb
Trace Impurities – Iron (Fe)	<= 50.0 ppb	<1.0 ppb
Trace Impurities – Lead (Pb)	<= 0.5 ppb	<0.5 ppb
Trace Impurities – Magnesium (Mg)	<= 7.0 ppb	<1.0 ppb
Trace Impurities – Manganese (Mn)	<= 1.0 ppb	<1.0 ppb
Trace Impurities – Mercury (Hg)	<= 0.5 ppb	<0.1 ppb
Trace Impurities – Nickel (Ni)	<= 2.0 ppb	<0.3 ppb
Trace Impurities – Potassium (K)	<= 500.0 ppb	<10.0 ppb
Trace Impurities – Selenium (Se)	<= 50.0 ppb	7.2 ppb
Trace Impurities – Silicon (Si)	<= 100.0 ppb	12.8 ppb
Trace Impurities – Silver (Ag)	<= 1.0 ppb	<1.0 ppb

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700

Avantor Performance Materials LLC

Sulfuric Acid

BAKER INSTRA-ANALYZED® Reagent

For Trace Metal Analysis

Low Selenium

 **avantors**™



Material No.: 9673-33

Batch No.: 2411262013

Test	Specification	Result
Trace Impurities – Sodium (Na)	≤ 500.0 ppb	< 5.0 ppb
Trace Impurities – Strontium (Sr)	≤ 5.0 ppb	< 1.0 ppb
Trace Impurities – Tin (Sn)	≤ 5.0 ppb	1.1 ppb
Trace Impurities – Zinc (Zn)	≤ 5.0 ppb	< 1.0 ppb

For Laboratory, Research, or Manufacturing Use

Country of Origin: United States

Packaging Site: Phillipsburg Mfg Ctr & DC



Jamie Croak

Director Quality Operations, Bioscience Production

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700

Avantor Performance Materials LLC

Certificate of Analysis

ThermoFisher
SCIENTIFIC

Certificate of Analysis

1 Reagent Lane

Fair Lawn, NJ 07410

201.796.7100 tel

201.796.1329 fax

Thermo Fisher Scientific's Quality System has been found to conform to Quality Management System
Standard ISO9001:2015 by SAI Global Certificate Number CERT – 0120633

This is to certify that units of the lot number below were tested and found to comply with the specifications of the grade listed. Certain data have been supplied by third parties. Thermo Fisher Scientific expressly disclaims all warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose. Products are for research use or further manufacturing. Not for direct administration to humans or animals. It is the responsibility of the final formulator and end user to determine suitability based upon the intended use of the end product. Products are tested to meet the analytical requirements of the noted grade. The following information is the actual analytical results obtained.

Catalog Number	SA226	Quality Test / Release Date	03/18/2024
Lot Number	235420		
Description	SULFURIC ACID, 0.02N, CERTIFIED		
Country of Origin	United States	Suggested Retest Date	Mar/2029

N/A			
Result Name	Units	Specifications	Test Value
APPEARANCE		REPORT	Clear, colorless liquid
COLOR	APHA	<= 5	<5
IDENTIFICATION	PASS/FAIL	= PASS TEST	PASS TEST
NORMALITY		Inclusive Between 0.0198 - 0.0202	0.0200
TRACEABLE TO NIST KHP STD	POT. ACID PHTHALATE	= LOT 84L	SRM 84I



Harout Sahagian - Quality Control Manager - Fair Lawn

Note: The data listed is valid for all package sizes of this lot of this product, expressed as an extension of this catalog number listed above.
If there are any questions with this certificate, please call at (800) 227-6701.

*Based on suggested storage condition.



W3163 Rec. on 12/10/24 by IZ

Certificate of Analysis



Material BDH9284-2.5KG
Material Description BDH SODIUM CARB ANHYD ACS 2.5KG
Grade U S P REAGENT (ACS GRADE)

Batch 24E3156178
Reassay Date 09/30/2027
CAS Number 497-19-8
Molecular Formula Na₂CO₃
Molecular Mass 105.99

Date of Manufacture 09/01/2023
Storage Room Temperature
Material is hygroscopic. Protect from Moisture.
Additional Product Description:

Characteristics	Specifications	Measured Values
Appearance	Fine white granular powder	Fine white granular powder
Calcium	<= 0.03 %	0.003 %
Chloride	<= 0.001 %	0.0003 %
Heavy Metals (as Pb)	<= 0.0005 %	0.0001 %
Insolubles	<= 0.01 %	0.001 %
Iron	<= 0.0005 %	0.0001 %
Loss on Heating	<= 1.0 %	0.03 %
Magnesium	<= 0.005 %	0.001 %
Phosphate	<= 0.001 %	0.001 %
Potassium	<= 0.005 %	0.003 %
Purity	>= 99.5 %	100.0 %
Silica	<= 0.005 %	0.001 %
Sulfur Compounds	<= 0.003 %	0.002 %
Extra Description:	Meets Reagent Specifications for testing USP/NF monographs	

Internal ID #: 710

Signature	Additional Information
We certify that this batch conforms to the specifications listed above. This document has been electronically produced and is valid without a signature. Leona Edwardson, Quality Control Sr. Manager - Solon VWR Chemicals, LLC. 28600 Fountain Parkway, Solon OH 44139 USA	Analysis may have been rounded to significant digits in specification limits Product meets analytical specifications of the grades listed.

Certificate of Analysis

231758 58

Buffer, Reference Standard, pH 4.00 ± 0.01 at 25°C (Color Coded Red)

Lot Number: 2411A93

Product Number: 1501

Manufacture Date: NOV 04, 2024

Expiration Date: OCT 2026

The certified value for this product is confirmed in independent testing by a second qualified chemist.

The NIST Traceable pH value is certified to ±0.01 at 25 °C only. All other pH values at their corresponding temperatures are accurate to ± 0.05.

°C	0	5	10	15	20	25	30	35	40	45	50
pH	4.00	4.00	4.00	4.00	4.00	4.00	4.01	4.02	4.03	4.04	4.06

Name	CAS#	Grade
Water	7732-18-5	ACS/ASTM/USP/EP
Potassium Acid Phthalate	877-24-7	Buffer
Preservative	Proprietary	Commercial
Red Dye	Proprietary	Purified

Test	Specification	Result
Appearance	Red liquid	Passed

*Not a certified value.

Test	Certified Value	Uncertainty	NIST SRM#
pH at 25°C (Method: SQCP027, SQCP033)	4.008	0.02	185i, 186-I-g, 186-II-g

Specification	Reference
Commercial Buffer Solutions	
Buffer B	ASTM (D 1293 B)
Buffer B	ASTM (D 5464)
Buffer B	ASTM (D 5128)

pH measurements were performed in our Pocomoke City, MD laboratory under ISO/IEC 17025 accreditation (ANAB Certificate L2387.01) and are certified traceable to National Institute of Standards and Technology (NIST) Standard Reference Material as indicated above via an unbroken chain of comparisons. The uncertainty is calculated from the uncertainty of the measurement variation from sample to sample, the uncertainty in the NIST Standard Reference Material, and the uncertainty of the measurement process. The uncertainty is multiplied by k=2, corresponding to 95% coverage in a normal distribution. Volumetric glassware complies with Class A tolerance requirements of ASTM E 288 and NIST Circular 434; it is calibrated before first use and recalibrated regularly in accordance with ASTM E 542 and NIST Procedure NBSIR 74-461. Balances are calibrated regularly with weights certified traceable to the NIST national mass standard. Thermometers and temperature probes are calibrated before first use and recalibrated regularly with a thermometer traceable to NIST standards. All products are prepared according to master documents that assure manufacture according to validated methods. Batch records document raw material traceability and production and testing history for each lot manufactured.

Part Number	Size / Package Type	Shelf Life (Unopened Container)
1501-16	500 mL natural poly	24 months
1501-2.5	10 L Cubitainer®	24 months
1501-5	20 L Cubitainer®	24 months

Recommended Storage: 15°C - 30°C (59°F - 86°F)



Refine your results. Redefine your industry.

Certificate of Analysis

300 Technology Drive
Christiansburg, VA 24073 USA
inorganicventures.com

P: 800-669-6799/540-585-3030
F: 540-585-3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).



2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Ion Chromatography Solution
Catalog Number: 300-CAL-A
Lot Number: V2-MEB742616
Matrix: H₂O
Value / Analyte(s):
150 µg/mL ea:
Sulfate,
100 µg/mL ea:
Bromide,
50 µg/mL ea:
o-Phosphate as P,
30 µg/mL ea:
Chloride, Nitrite as N,
25 µg/mL ea:
Nitrate as N,
20 µg/mL ea:
Fluoride

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Bromide, Br	100.0 ± 0.5 µg/mL	Chloride, Cl	30.01 ± 0.13 µg/mL
Fluoride, F-	20.00 ± 0.07 µg/mL	Nitrate as N, NNO ₃ -	25.00 ± 0.10 µg/mL
Nitrite as N, NNO ₂ -	30.00 ± 0.10 µg/mL	o-Phosphate as P, PPO ₄	50.00 ± 0.18 µg/mL
Sulfate, SO ₄	150.0 ± 0.8 µg/mL		

Density: 0.999 g/mL (measured at 20 ± 4 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Br	IC Assay	3184	151130
Br	Fajans	999c	999c
Cl	IC Assay	3182	190830
Cl	Fajans	999c	999c
F-	IC Assay	3183	140203
NNO3-	IC Assay	3185	170309
NNO2-	IC Assay	Traceable to 40H	08228TH-H2
NNO2-	Calculated	40h	40h
PPO4	IC Assay	3186	170606
SO4	IC Assay	3181	080603

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$$X_{CRM/RM} = \sum(w_i)(X_i)$$

X_i = mean of Assay Method i with standard uncertainty $u_{char i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$$w_i = (1/u_{char i}^2) / (\sum(1/u_{char i}^2))$$

$$CRM/RM \text{ Expanded Uncertainty } (\pm) = U_{CRM/RM} = k(u_{char}^2 + u_{bb}^2 + u_{lts}^2 + u_{ts}^2)^{1/2}$$

k = coverage factor = 2

$u_{char} = [\sum(w_i)^2(u_{char i}^2)]^{1/2}$ where $u_{char i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$$X_{CRM/RM} = (X_a)(u_{char a})$$

X_a = mean of Assay Method A with

$u_{char a}$ = the standard uncertainty of characterization Method A

$$CRM/RM \text{ Expanded Uncertainty } (\pm) = U_{CRM/RM} = k(u_{char a}^2 + u_{bb}^2 + u_{lts}^2 + u_{ts}^2)^{1/2}$$

k = coverage factor = 2

$u_{char a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 CHROMATOGRAM

N/A

6.0 INTENDED USE

6.1 This standard is intended for the calibration of analytical instruments and validation of analytical methods as appropriate. This CRM may be used in connection with EPA Methods 6010, 6020 (all versions), Standard Methods 3120 B and USP <232> / ICH Q3D.

6.2 For products attaining traceability through Inorganic Ventures' Primary Certified Reference Materials (PCRM™) see the Limited License to Use PCRM™ in the Inorganic Ventures [Terms and Conditions of Sale](https://www.inorganicventures.com/terms-and-conditions-sale). The Terms and Conditions contain information on the use of materials traceable to PCRM™ certified reference materials. This Limited License agreement is especially pertinent for laboratories accredited under ISO:17034.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.
- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.
- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit www.inorganicventures.com/TCT

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

April 02, 2024

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **April 02, 2029**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:

Uyen Truong
Custom Processing Supervisor



Certificate Approved By:

Thomas Kozikowski
Stock VS Manager



Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director



Certificate of Analysis

Buffer, Reference Standard, pH 7.00 ± 0.01 at 25°C (Color Coded Yellow)

Lot Number: 2504D34

Product Number: 1551

Manufacture Date: APR 03, 2025

Expiration Date: MAR 2027

The certified value for this product is confirmed in independent testing by a second qualified chemist.

The NIST traceable pH value is certified to ±0.01 at 25 °C only. All other pH values at their corresponding temperatures are accurate to ± 0.05.

°C	0	5	10	15	20	25	30	35	40	45	50
pH	7.12	7.09	7.06	7.04	7.02	7.00	6.99	6.98	6.98	6.97	6.97

Name	CAS#	Grade
Water	7732-18-5	ACS/ASTM/USP/EP
Sodium Phosphate Dibasic	7558-79-4	ACS
Potassium Dihydrogen Phosphate	7778-77-0	ACS
Preservative	Proprietary	
Yellow Dye	Proprietary	
Sodium Hydroxide	1310-73-2	Reagent (from ACS)

Test	Specification	Result
Appearance	Yellow liquid	Passed

*Not a certified value.

Test	Certified Value	Uncertainty	NIST SRM#
pH at 25°C (Method: SQCP027, SQCP033)	7.003	0.02	186-I-g, 186-II-g, 191d

Specification	Reference
Commercial Buffer Solutions	ASTM (D 1293 B)
Buffer A	ASTM (D 5464)
Buffer A	ASTM (D 5128)

pH measurements were performed in our Pocomoke City, MD laboratory under ISO/IEC 17025 accreditation (ANAB Certificate L2387.01) and are certified traceable to National Institute of Standards and Technology (NIST) Standard Reference Material as indicated above via an unbroken chain of comparisons. The uncertainty is calculated from the uncertainty of the measurement variation from sample to sample, the uncertainty in the NIST Standard Reference Material, and the uncertainty of the measurement process. The uncertainty is multiplied by k=2, corresponding to 95% coverage in a normal distribution. Volumetric glassware complies with Class A tolerance requirements of ASTM E 288 and NIST Circular 434; it is calibrated before first use and recalibrated regularly in accordance with ASTM E 542 and NIST Procedure NBSIR 74-461. Balances are calibrated regularly with weights certified traceable to the NIST national mass standard. Thermometers and temperature probes are calibrated before first use and recalibrated regularly with a thermometer traceable to NIST standards. All products are prepared according to master documents that assure manufacture according to validated methods. Batch records document raw material traceability and production and testing history for each lot manufactured.

Part Number	Size / Package Type	Shelf Life (Unopened Container)
1551-2.5	10 L Cubitainer®	24 months
1551-20	20 x 20 mL pack	24 months
1551-32	1 L natural poly	24 months
1551-5	20 L Cubitainer®	24 months

Recommended Storage: 15°C - 30°C (59°F - 86°F)



Jose Pena (04/03/2025)
Operations Manager

This product was tested in an ISO 17025 Accredited Laboratory

This test report shall not be reproduced, except in full, without the written approval of Ricca Chemical Company.