

Certificate of Analysis

Standard Minerals

Lot Number 118019-118020

Order Number 5082

Expiration Date 5/2009

Material Description:

This material is designed to be used for USEPA or ASTM methods related to the certified properties below. The procedures used for certification are consistent with ISO Guide 35 for the Certification of Reference Materials. Selected samples of the material have been evaluated and found to be homogeneous at the 95% Confidence Level for each certified property. This material was prepared and analyzed by Analytical Products Group, Inc. It was further certified by evaluation in an interlaboratory round-robin program.

Instructions for Use

One sample is prepared from the two vials. Caution should be taken not to directly mix the contents of the two vials.

Add 900 mL of laboratory grade water to a one liter volumetric flask, pipet 10.0 mL of vial #1 and 10.0 mL of vial #2 into the flask. Mix well and dilute to the mark with laboratory grade water.

Caution: This sample may be tested for either Calcium Hardness or Total Hardness as CaCO₃. The USEPA has defined Calcium Hardness as the Calcium component of Total Hardness. USEPA recommends that laboratories use ASTM Method D511-93A or Standard Methods 3500-Ca-B to test Calcium Hardness. If your Hardness method includes Magnesium then you should report your results under Total Hardness as CaCO₃.

Certified Values:

The Prepared Value of the property is the calculated theoretical value of the property based upon the method of preparation. The Certified Value of the property is the analytical Mean value based upon the method indicated. The Uncertainty of the reported Certified Value is estimated as $2s/\sqrt{n}$. For properties which are Certified but a NIST SRM number is not indicated, the calibration used was an independently prepared material.

Property	Units	Prepared Value	Certified Value	Method	Traceable NIST SRM
Alkalinity as CaCO ₃	mg/L	34.3	34.8±0.0759	Titrimetric	723d
Calcium	mg/L	36.1	36.2±0.307	ICP	3109
Calcium Hardness as CaCO ₃	mg/L	90.2	90.3±0.767	Calculation	
Chloride	mg/L	97.4	99.1±0.78	Titrimetric	919a
Conductivity	umhos	442	442±1.15	Conductivity	3192
Magnesium	mg/L	7.64	7.43±0.0557	ICP	3131a
Potassium	mg/L	15.8	15.9±0.155	ICP	200a
Sodium	mg/L	20.4	20.5±0.161	ICP	3152a
Sulfate	mg/L	13.7	14±0.131	ICP	3154
Total Dissolved Solids at 180°C	mg/L	230	230±0.871		



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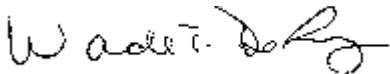
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Total Hardness as CaCO₃ mg/L 122 121±1.01 Calculation

Interlaboratory Certification:

This material was certified in an interlaboratory round robin program. The reported acceptance limits are calculated based upon the NELAC Fields of Proficiency Testing. For properties not covered by the NELAC Fields of Proficiency Testing, acceptance limits are based upon the Mean and Standard Deviation of the interlaboratory data.

Property	Units	Certified Value	Mean	Std Dev	Acceptance Limits
Alkalinity as CaCO ₃	mg/L	34.8±0.0759	34.8	1.77	30.9 -38.3
Calcium	mg/L	36.2±0.307	36.4	2.09	32.2 -40.6
Calcium Hardness as CaCO ₃	mg/L	90.3±0.767	90.9	5.22	80.4 -101
Chloride	mg/L	99.1±0.78	97.5	4.33	87.7 -107
Conductivity	umhos	442±1.15	442	22.1	398 -486
Magnesium	mg/L	7.43±0.0557	7.72	0.432	6.85 -8.58
Potassium	mg/L	15.9±0.155	16.1	1.26	13.6 -18.6
Sodium	mg/L	20.5±0.161	20.3	1.11	18 -22.5
Sulfate	mg/L	14±0.131	13.5	1.29	10.9 -16
Total Dissolved Solids at 180°C	mg/L	230±0.871	241	40.5	160 -323
Total Hardness as CaCO ₃	mg/L	121±1.01	123	7.01	109 -137



Wade DeLong
Laboratory Manager



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