

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICUS-3411
Lot Number: CP-5207
Product Name: Custom Standard

Lot Issue Date: 17-Oct-2016
Expiration Date: 30-Nov-2017

Description:

This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. For each analyte, the calculated value and manufacturing tolerance is reported below.

Analyte	Starting Material	Lot Number	Purity	Calculated Value
silver nitrate (ICP grade) (as silver)	silver nitrate (99.9999%)	RM07883	99.999 %	1.00 ± 0.01 mg/L
aluminum nitrate nonahydrate (ICP grade) (as aluminum)	aluminum nitrate nonahydrate	RM10323	99.999 %	50.1 ± 0.3 mg/L
arsenic (III) oxide (ICP grade) (as arsenic)	arsenic (III) oxide	RM07873	99.995 %	2.50 ± 0.01 mg/L
boric acid (ICP grade) (as boron)	boric acid	RM07834	99.999 %	25.0 ± 0.1 mg/L
barium nitrate (ICP grade) (as barium)	barium nitrate	RM07892	99.999 %	2.50 ± 0.01 mg/L
beryllium acetate (ICP grade) (as beryllium)		RM07400-001		1.50 ± 0.01 mg/L
calcium carbonate (ICP grade) (as calcium)	calcium carbonate	RM10833	99.999 %	500.9 ± 2.5 mg/L
cadmium nitrate hydrate (ICP grade) (as cadmium)	cadmium nitrate hydrate	RM07887	99.999 %	1.00 ± 0.01 mg/L
cobalt nitrate hexahydrate (ICP grade) (as cobalt)	cobalt nitrate hexahydrate	RM07860	99.999 %	1.00 ± 0.01 mg/L
copper (II) nitrate hydrate (ICP grade) (as copper)	copper (II) nitrate hydrate	RM07868	99.999 %	2.50 ± 0.01 mg/L
chromium (III) nitrate nonahydrate (ICP grade) (as chromium)	chromium (III) nitrate nonahydrate	RM11281	99.999 %	2.50 ± 0.01 mg/L
iron (III) nitrate, ferric nitrate (ICP grade) (as iron)	iron (III) nitrate	RM10531	99.999 %	50.1 ± 0.3 mg/L
potassium nitrate (ICP grade) (as potassium)	potassium nitrate	RM07425	99.999 %	500.8 ± 2.5 mg/L
magnesium nitrate hexahydrate (ICP grade) (as magnesium)	magnesium nitrate hexahydrate	RM07690	99.999 %	50.0 ± 0.3 mg/L
manganese (II) nitrate (ICP grade) (as manganese)	manganese (II) nitrate	RM07858	99.995 %	2.50 ± 0.01 mg/L
molybdenum (VI) oxide (ICP grade) (as molybdenum)	molybdenum (VI) oxide	RM07369	99.998 %	2.50 ± 0.01 mg/L
sodium nitrate (ICP grade) (as sodium)	sodium nitrate (99%)	RM10629	99.999 %	500.9 ± 2.5 mg/L
nickel (II) nitrate hexahydrate (ICP grade) (as nickel)	nickel (II) nitrate hexahydrate	RM09244	99.999 %	2.50 ± 0.01 mg/L
lead (II) nitrate (ICP grade) (as lead)	lead (II) nitrate	RM07904	99.999 %	1.00 ± 0.01 mg/L
antimony (ICP grade)	antimony (ICP grade)	RM08187	100.0 %	2.50 ± 0.01 mg/L
selenium (IV) oxide (ICP grade) (as selenium)	selenium (IV) oxide	RM10651	99.999 %	5.01 ± 0.03 mg/L
strontium nitrate (ICP grade) (as strontium)	strontium nitrate (99.999%)	RM07877	99.999 %	2.50 ± 0.01 mg/L
ammonium hexafluorotitanate (IV) (ICP grade) (as titanium)	ammonium hexafluorotitanate (IV)	RM10150	99.999 %	2.50 ± 0.01 mg/L
thallium (I) nitrate (ICP grade) (as thallium)	thallium (I) nitrate	RM10594	99.99 %	1.00 ± 0.01 mg/L
ammonium metavanadate (ICP grade) (as vanadium)	ammonium metavanadate	RM07842	99.999 %	5.00 ± 0.03 mg/L
zinc nitrate hexahydrate (ICP grade) (as zinc)	zinc nitrate hexahydrate	RM07777	99.999 %	25.0 ± 0.1 mg/L

Solvent: 5% nitric acid with trace hydrofluoric and tartaric acids in water

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Storage: Store at Room Temperature (15° to 30°C).

Traceability:

Balances used are calibrated with weights traceable to NIST in compliance with ANSI/NCCL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Homogeneity:

This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:

This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:

Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay. Each unit contains slightly more than the stated labeled volume to facilitate transfer of the material for testing.

Should crystallization occur after refrigeration, gentle warming (<40°C) and shaking of the container is usually sufficient to re-dissolve the material. If this is unsuccessful, an ultrasonic bath may be used. Solutions containing volatile components (such as gases) should be chilled prior to opening to minimize headspace problems.

Hazards:

Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:

The certification of this RM is valid until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

Maintenance of Certification:

The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.


John Russo
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