

CERTIFICATE OF ANALYSIS

SPS-SW1 Batch 113

Reference Material for Measurement of Elements in Surface Waters

This Reference Material is intended for daily use in conjunction with measurement of elements in surface waters. The water solution contains 45 elements with concentrations traceable to ultrapure metals or stoichiometrically well-defined substances. The certified values are based on a gravimetric procedure, i.e. weight per volume composition of the primary reference material dissolved in high purity sub-distilled acids. The primary reference materials used in the production have been traced to Standard Reference Materials issued by National Institute of Standards and Technology (USA) by chemical measurements applying inductively coupled plasma atomic emission spectrometry and/or inductively coupled plasma mass spectrometry.

Stability: The certificate is valid for 3 years from the production date (June 27, 2007) provided that the sample solution is kept tightly capped and stored under normal laboratory conditions (less than 30 °C). The solution contains 0.5% nitric acid (W/V).

Element	Concentration in ng/ml (20 °C) ^a	Tracable to NIST SRM	Element	Concentration in ng/ml (20 °C) ^a	Tracable to NIST SRM
Al	50 ± 1	3101a	Na	2000 ± 20	3152a
As	10.0 ± 0.1	3103	Nd	0.50 ± 0.01	3135
B	50 ^b	3107	Ni	10.0 ± 0.1	3136
Ba	50 ± 1	3104	P	100 ± 1	3139
Ca	2000 ± 20	3109a	Pb	5.0 ± 0.1	3128
Cd	0.50 ± 0.01	3108	Pr	0.50 ± 0.01	3142
Ce	0.50 ± 0.01	3110	Rb	10.0 ± 0.1	3145
Co	2.00 ± 0.02	3113	S	2000 ± 20	3154
Cr	2.00 ± 0.02	3112	Sc	0.50 ± 0.01	3148
Cs	2.00 ± 0.02	3111	Se	2.00 ± 0.02	3149
Cu	20 ± 1	3114	Si	1000 ± 10	3150
Dy	0.50 ± 0.01	3115	Sm	0.50 ± 0.01	3147
Er	0.50 ± 0.01	3116	Sr	50.0 ± 0.5	3153
Eu	0.50 ± 0.01	3117	Tb	0.50 ± 0.01	3157
Fe	20 ± 1	3126	Th	0.50 ± 0.01	3159
Gd	0.50 ± 0.01	3118	Tl	0.50 ± 0.01	3158
Ho	0.50 ± 0.01	3123	Tm	0.50 ± 0.01	3160
K	200 ± 2	3141a	U	0.50 ± 0.01	3164
La	0.50 ± 0.01	3127	V	10.0 ± 0.1	3165
Lu	0.50 ± 0.01	3130	Y	0.50 ± 0.01	3167
Mg	400 ± 4	3131a	Yb	0.50 ± 0.01	3166
Mn	10.0 ± 0.1	3132	Zn	20 ± 1	3168a
Mo	10.0 ± 0.1	3134			

^a The uncertainties (half with of the 95 % confidence intervals) listed for the individual elements is based on scientific judgement and represents an estimate of the combined effects of any error, attributed to gravimetric and volumetric procedures, purity of the source material and possible contamination throughout the production steps.

^b Information value only.



Signature by:


Knut Andersen
Certifying Officer

Oslo, June 28, 2007
Certificate revision 1.0