



Certificate of Analysis

Certipur® Certified Reference Material

Producer:	Merck KGaA, Frankfurter Str. 250, 64293 Darmstadt, Germany.
Description of CRM:	ICP multi-element standard solution IV
Ord. No.:	1.11355.0100
Lot No.:	HC67834755
Composition:	23 elements in HNO ₃ Suprapur® 6.5%
Density:	The density of the standard solution is 1.0905 g/cm ³ at 20°C.
Method of Analysis:	Inductively coupled plasma optical emission spectrometry (ICP-OES).
Traceability:	This reference material has been measured applying high precision ICP-OES and is directly traceable to the corresponding NIST SRM® as mentioned on page 2. <i>NIST: National Institute of Standards and Technology, Gaithersburg, USA.</i>
Storage:	Store at +15°C to +25°C tightly closed in the original container.
Application and correct use:	This reference material is intended for use as calibration standard for atomic absorption spectrometry, spectrophotometry and other analytical techniques. Shake well before use and never pipet directly from the original container.
Date of release:	2016/03/01
Minimum shelf life:	2019/02/28

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Mass concentration (w/v) ± expanded measurement uncertainty

Element	Certified value mg/l	Uncertainty mg/l	Traceable to SRM®	Batch Code
Ag	1000	± 10	SRM 3151	992212
Al	1000	± 10	SRM 3101a	140903
B	1001	± 10	SRM 3107	110830
Ba	994	± 10	SRM 3104a	070222
Bi	999	± 10	SRM 3106	991212
Ca	1003	± 10	SRM 3109a	130213
Cd	998	± 10	SRM 3108	130116
Co	998	± 10	SRM 3113	000630
Cr	1001	± 10	SRM 3112a	030730
Cu	1000	± 10	SRM 3114	121207
Fe	1004	± 10	SRM 3126a	140812
Ga	1001	± 10	SRM 3119a	140124
In	1000	± 10	SRM 3124a	110516
K	1004	± 10	SRM 3141a	140813
Li	1000	± 10	SRM 3129a	100714
Mg	999	± 10	SRM 3131a	140110
Mn	1001	± 10	SRM 3132	050429
Na	996	± 10	SRM 3152a	120715
Ni	1000	± 10	SRM 3136	120619
Pb	998	± 10	SRM 3128	101026
Sr	996	± 10	SRM 3153a	990906
Tl	999	± 10	SRM 3158	993012
Zn	1001	± 10	SRM 3168a	120629

This Certificate of Analysis is based on the data from the accredited Merck, Darmstadt, Germany Calibration Laboratory according to DIN EN ISO/IEC 17025.

The expanded measurement uncertainty U is calculated as $U = k \cdot u_{\text{characterisation}}$, where $k = 2$ is the coverage factor for a 95% coverage probability and $u_{\text{characterisation}}$ is the combined measurement uncertainty in accordance to DIN EN ISO/IEC 17025.

A. Yildirim

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(Laboratory manager)