Specification – Certified Reference Material

Element ICP Standard Solution 10 mg/l

Accreditation:

Deutsche Akkreditierungsstelle D-RM-15185-01-00

Merck KGaA, Darmstadt, Germany is accredited by the German accreditation authority as registered reference material producer (D-RM-15185-01-00) in accordance with **ISO 17034**.

Producer: Merck KGaA, Frankfurter Str. 250, 64293 Darmstadt, Germany
Description of CRM: Element ICP Standard Solution 10 mg/l
Expiry date: 4 years
Storage: +15°C to +25°C tightly closed in the original container
Specification: 9.3 – 10.4 mg/kg

Article	Analyte	Description of CRM	Associated uncertainty*, $U=k\cdot u$ ($k=2$) as mass fraction
1.08525	Rh	Rhodium ICP Standard	± 0.2 mg/kg
1.70391	Th	Thorium ICP Standard	± 0.2 mg/kg
1.70360	U	Uranium ICP Standard	± 0.4 mg/kg

* The uncertainty can vary depending on the primary reference material.

Metrological traceability: Directly traceable to the corresponding / suitable primary standard NIST SRM
NIST: National Institute of Standards and Technology, Gaithersburg, USA

Measurement method: Inductively coupled plasma optical emission spectrometry ICP-OES.

Intended use: This certified reference material is intended for use as a calibration standard in element analysis.

Associated uncertainty:

The associated uncertainty U_{CRM} reported with the certified values is calculated as combined expanded uncertainty $U_{CRM}=k \cdot u_{CRM}$ in accordance with GUM and EA-4/02, with $k=2$ as the coverage factor for a 95% coverage probability.

The combined uncertainty u_{CRM} is derived from combination of the squared uncertainty contributions:

$$u_{CRM} = \sqrt{u^2_{characterisation} + u^2_{homogeneity} + u^2_{stability}}$$

$u_{characterisation}$: is the uncertainty in accordance with DIN EN ISO/IEC 17025 which includes the contributions of the primary reference material and the measuring system. The characterisation measurements have been conducted by our DAkkS accredited calibration laboratory.

$u_{homogeneity}$: is the between-bottle variation in accordance with ISO 17034. The assessment of homogeneity is performed by analysis of a representative number of systematically chosen sample units.

$u_{stability}$: is the uncertainty obtained from short-term and long-term stability in accordance with ISO 17034. The stability studies are the basis for the quantification of the expiry date of this reference material for the unopened bottle.

Detailed information is provided by the certificates and the certification report on our website.