Certificate of Analysis – Certified Reference Material

Certipur® Sulfate standard solution

Producer: Merck KGaA, Frankfurter Str. 250, 64293 Darmstadt, Germany
Product no.: 1.04694.0500
Lot no.: HC46158494
Description of CRM: Sulfate standard solution 1000 mg/l
Expiry date: 2027/10/31
Storage: +15°C to +25°C tightly closed in the original container
Composition: Na_2SO_4 in H_2O

Analyte	Certified value as mass concentration	Associated uncertainty, $U=k \cdot u$ ($k=2$) as mass concentration
Sulfate	**1004 mg/l**	**± 6 mg/l**

Metrological traceability: Traceable to the corresponding primary standard NIST SRM Zinc 682.

Measurement method: The certified mass concentration was determined by potentiometric titration with lead(II) nitrate as titration solution. The certified value is based on a molecular mass for sulfate M = 96.06 g/mol.

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

Instructions for handling and correct use: Shake well before use and never pipet directly from the original container.

Health and safety information: Please refer to the Safety Data Sheet for detailed information about the nature of any hazard and appropriate precautions to be taken.

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

Certificate issue date: 2024/11/25

ilac-MRA DAkkS Deutsche Akkreditierungsstelle D-RM-15185-01-00

ISO 17034

CRM released by Approving Officer
or delegate of Quality Control

A. Yildirim

Dipl.-Ing. Ayfer Yildirim
Responsible Laboratory Manager

Certification process details:

Certipur® IC standards are prepared from high purity salts. Characterisation of Certipur® IC standards is carried out by the accredited quality control (QC) laboratory at Merck KGaA, Darmstadt, Germany according to DIN EN ISO / IEC 17025 by measuring the mass concentration by potentiometric titration.

Homogeneity and stability studies are performed with the material according to the requirements of ISO 17034 and ISO Guide 35.

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 elemental standard for the unopened bottle.

For more detailed information please read the certification report on our website.

Certificate of analysis revision history:

Certificate version	Date	Reason for version
01	2024/11/25	Initial version

The vibrant M, Supelco, Certipur, Suprapur and Sigma-Aldrich are trademarks of Merck KGaA, Darmstadt, Germany or its affiliates.
Detailed information on trademarks is available via publicly accessible resources.
© 2024 Merck KGaA, Darmstadt, Germany and/or its affiliates. All Rights Reserved.

The life science business of Merck KGaA, Darmstadt, Germany operates as MilliporeSigma in the U.S. and Canada.