

Standard Reference Material[®] 929a
Magnesium Gluconate
CERTIFICATE OF ANALYSIS

Purpose: The certified value delivered by this Standard Reference Material (SRM) is intended for validating methods for magnesium analysis and for the routine critical evaluation of daily working standards used in these procedures.

Description: A unit of SRM 929a consists of 5 g of magnesium gluconate dihydrate: $\text{Mg}(\text{C}_6\text{H}_{11}\text{O}_7)_2 \cdot 2\text{H}_2\text{O}$.

Certified Value: The magnesium concentration, expressed as a mass fraction percent on a dry-mass basis (see “Drying Instructions”), is based on measurements using isotope dilution – inductively coupled plasma – mass spectrometry (ID-ICP-MS) [1].

Certified Magnesium Mass Fraction: 5.362 % \pm 0.027 %

The uncertainty in the certified value is calculated as $U = ku_c$, where u_c is the combined standard uncertainty calculated according to the ISO/JCGM and NIST Guides [2] and k is the coverage factor. The value of u_c is intended to represent, at the level of one standard deviation, the combined effect of uncertainty components associated with the measurement uncertainty and additional Type B uncertainties. The coverage factor is 2. The expanded uncertainty, $U = ku_c$, is defined as an interval estimated to have a level of confidence of 95 %. The measurand is the total mass fraction of magnesium. The certified value is metrological traceable to the International System of Units (SI) units of mass, expressed as percent [3].

Period of Validity: The certified value delivered by **SRM 929a** is valid within the measurement uncertainty specified until **01 February 2045**. The certified value is nullified if the material is stored or used improperly, damaged, contaminated, or otherwise modified.

Maintenance of Certified Value: NIST will monitor this SRM over the period of its validity. If substantive technical changes occur that affect the certification, NIST will issue an amended certificate through the NIST SRM website (<https://www.nist.gov/srm>) and notify registered users. SRM users can register online from a link available on the NIST SRM website or fill out the user registration form that is supplied with the SRM. Registration will facilitate notification. Before making use of any of the values delivered by this material, users should verify they have the most recent version of this documentation, available through the NIST SRM website (<https://www.nist.gov/srm>).

Safety: SRM 929a is intended for research use.

Storage: SRM 929a should be stored in the tightly closed, original bottle under normal laboratory conditions. Tests show this material to be hygroscopic and must be dried as directed before use; such drying will not remove water of hydration. Stored under these conditions, this material will show no significant change in properties.

Use: A standard solution containing 5.00 mmol/L of magnesium may be prepared by placing 1.133 g of dried SRM 929a in a 500-mL volumetric flask and dissolving the material with laboratory reagent grade water (see list below). Lower concentrations required for analysis may be prepared by accurate dilutions.

Laboratory reagent grade water meeting any of the following specifications:

American Society for Testing and Materials (ASTM): D1193-Type II
College of American Pathologists (CAP): Type II
National Committee for Clinical Laboratory Standards (NCCLS): Type I

Stability of Prepared Solution: Solutions of SRM 929a prepared as instructed are stable for at least 60 days under normal laboratory conditions.

Drying Instructions: This certified value is based on a minimum sample of 400 mg of the SRM dried to constant weight for at least 72 hours over fresh anhydrous magnesium perchlorate. The certified value is based on the determination of magnesium in the *dried material*.

Source: The magnesium gluconate dihydrate used for this SRM was obtained from the Spectrum Laboratory Products, Inc. (Gardena, CA).

REFERENCES

- [1] Long, S.E.; Murphy, K.E.; *Compilation of Higher-Order Methods for the Determination of Electrolytes in Clinical Materials*; NIST 260-162.
- [2] JCGM 100:2008; *Evaluation of Measurement Data — Guide to the Expression of Uncertainty in Measurement* (GUM 1995 with Minor Corrections); Joint Committee for Guides in Metrology (JCGM) (2008); available at <https://www.bipm.org/en/committees/jc/jcgm/publications> (accessed Feb 2025); see also Taylor, B.N.; Kuyatt, C.E.; *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*; NIST Technical Note 1297, U.S. Government Printing Office: Washington, DC (1994); available at <https://www.nist.gov/pml/nist-technical-note-1297> (accessed Feb 2025).
- [3] Beauchamp, C.R.; Camara, J.E.; Carney, J.; Choquette, S.J.; Cole, K.D.; DeRose, P.C.; Duewer, D.L.; Epstein, M.S.; Kline, M.C.; Lippa, K.A.; Lucon, E.; Molloy, J.; Nelson, M.A.; Phinney, K.W.; Polakoski, M.; Possolo, A.; Sander, L.C.; Schiel, J.E.; Sharpless, K.E.; Toman, B.; Winchester, M.R.; Windover, D.; *Metrological Tools for the Reference Materials and Reference Instruments of the NIST Material Measurement Laboratory*; NIST Special Publication 260-136, 2021 edition; National Institute of Standards and Technology, Gaithersburg, MD (2021); available at <https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.260-136-2021.pdf> (accessed Feb 2025).

Certificate Revision History: 11 February 2025 (Change of period of validity; updated format; editorial changes); 06 January 2016 (Editorial changes); 26 April 2005 (Original certificate date).

Certain commercial equipment, instruments, or materials may be identified in this Certificate of Analysis to adequately specify the experimental procedure. Such identification does not imply recommendation or endorsement by the National Institute of Standards and Technology, nor does it imply that the materials or equipment identified are necessarily the best available for the purpose.

Users of this SRM should ensure that the Certificate of Analysis in their possession is current. This can be accomplished by contacting the Office of Reference Materials 100 Bureau Drive, Stop 2300, Gaithersburg, MD 20899-2300; telephone (301) 975-2200; e-mail srminfo@nist.gov; or the Internet at <https://www.nist.gov/srm>.

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