

U. S. Department of Commerce
Frederick B. Dent
Secretary
National Bureau of Standards
Richard W. Roberts, Director

National Bureau of Standards Certificate of Analysis Standard Reference Material 924 Lithium Carbonate

This Standard Reference Material is certified as a chemical of known purity. It is intended primarily for use in calibration and standardization of procedures employed in clinical analysis and for the routine critical evaluation of daily working standards used in these procedures.

Purity 100.0₅ ± 0.0₂ Percent

The purity shown is based on the determination of the carbonate ion by coulometric acidimetry. The molecular weight for lithium carbonate employed in the calculations is 73.9486. This value is based on a mass-spectrometrically determined value of 6.9696 for the atomic weight of lithium in this sample. The uncertainty shown represents the 95-percent confidence interval of the mean based on 16 determinations. The assay in excess of 100 percent may be due to anion impurities of lower molecular weight than the carbonate ion, e.g., hydroxide.

This Standard Reference Material is of limited certification because no actual determination of lithium content was made. The certification is based on the analysis of the carbonate anion and the proven absence (or presence in trace quantities) of metallic cations.

The lithium carbonate used for this Standard Reference Material was obtained from the J. T. Baker Chemical Company of Phillipsburg, New Jersey. Analyses were performed by G. Marinenko, M. Darr, E. L. Garner, T. C. Rains, and T. A. Rush.

The overall direction and coordination of technical measurements leading to certification were under the chairmanship of R. A. Durst.

The technical and support aspects concerning preparation, certification, and issuance of this Standard Reference Material were coordinated through the Office of Standard Reference Materials by T. W. Mears.

Washington, D. C. 20234
February 23, 1972
Revised November 23, 1973

J. Paul Cali, Chief
Office of Standard Reference Materials

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The lithium carbonate meets or exceeds the specifications for reagent grade lithium carbonate as given in Reagent Chemicals, 4th edition, published by the American Chemical Society. A semi-quantitative survey for trace contaminants by emission spectroscopy showed no significant metallic impurities. Atomic absorption and flame emission spectrometry showed neither alkali metal nor alkaline-earth impurities in excess of 1 ppm except calcium (4 ppm).

This Standard Reference Material is intended for "in vitro" diagnostic use only.

This material is intended for use as a standard for determination of lithium in clinical chemistry. For best results using either atomic absorption spectroscopy or flame emission photometry it is necessary that lithium be determined against a background of sodium and potassium.

A "standard" solution containing 1.00 mmol of lithium per liter may be prepared as follows. Dry SRM 924 for 4 hours at 200 °C, then cool to room temperature in a desiccator. Dissolve 73.91 mg of SRM 924 in 50 ml of deionized water and 20 ml of 0.1N HCl (ACS Reagent Grade). Dilute to the mark with deionized water and mix well in a 2-liter class-A volumetric flask.

A "blank" solution containing 140 mmol of sodium per liter and 5 mmol of potassium per liter may be prepared as follows: Dissolve 8.18 g of sodium chloride (SRM 919) and 0.373 g of potassium chloride (SRM 918) in deionized water. Bring to the mark of a 1-liter flask with deionized water and mix well.

Working standards containing 0.10 or 0.20 mmol of lithium, 14 mmol of sodium and 0.5 mmol of potassium per liter may be prepared as follows. To each of two 100-ml volumetric flasks add 10 ml of "blank solution". Add exactly 10.00 ml of "standard solution" to one flask and exactly 20.00 ml of "standard solution" to the second flask using class-A volumetric pipettes. Dilute each flask to the mark with deionized water and shake well.

This Standard Reference Material should be stored in the well-closed original bottle under normal laboratory conditions.

The solutions of SRM 924 are stable indefinitely when stored in a well-stoppered, all-glass container. All such solutions should be clear and display no turbidity.

References:

- [1] J. Pybus and G. N. Bowers, Jr., Serum lithium determination by atomic absorption spectroscopy, in Standard Methods of Clinical Chemistry, Vol. 6, R. P. McDonald, editor-in-chief, pp 189-192, Academic Press, Inc., New York, N. Y. (1970).
- [2] A. L. Levy and E. M. Katz, A comparison of serum lithium determinations using flame photometry and atomic absorption. Clin. Chem. 15, 787 (1969).

This Standard Reference Material has been measured and certified at the laboratories of the National Bureau of Standards, Gaithersburg, Maryland. All inquiries should be addressed to:

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Room B311, Chemistry Building
National Bureau of Standards
Washington, D. C. 20234

The date of issuance and certification of this Standard Reference Material was February 23, 1972.