U.S. Department of Commerce
Juanita M. Kreps
Secretary

National Bureau of Standards
Ernest Ambler, Acting Director

National Bureau of Standards Certificate

Standard Reference Material 927

Bovine Serum Albumin (7% Solution)

(Total Protein Standard)

Dennis J. Reeder and Robert Schaffer

This Standard Reference Material (SRM) is certified as a solution of known protein concentration and purity. It conforms to the specification for standardized protein solution approved by the National Committee for Clinical Laboratory Standards (NCCLS) [1]. SRM 927 was prepared from the same lot of bovine serum albumin as SRM 926, brought to proper ionic strength with sodium chloride and to proper pH with sodium hydroxide. It was sterilized by membrane filtration. This SRM is intended primarily for use in the calibration and standardization of procedures employed in clinical analyses for total serum protein determinations and for routine critical evaluation of daily working standards used in these procedures.

Table 1. Certified Data

Peptide mass (g/L)*	
Biuret method [2]	70.45 ± 0.10
Kjeldahl method	70.48 ± 0.50
Method using optical density at 278 nm	70.77 ± 0.23
pH	6.66 ± 0.01
Sodium ion, substance concentration (mol/L)	0.0291 ± 0.0004
Chloride ion, substance concentration (mol/L)	0.0210 ± 0.0002
Volume (mL)	2.06 - 2.28

*The spelling of "liter" and its symbol "L" are recommended usage in the United States (Federal Register, **41**, 51089, December 10, 1976).

The inaccuracies expressed in the above table are one standard deviation (σ), except for the peptide mass by biuret method. In the analysis of the biuret data, regression curves were developed for three separate experiments involving at least 80 separate correlated measurements. Thus, the final data is expressed in terms of standard error ($\sigma/\sqrt{n}$), rather than standard deviation.

The bovine serum albumin solution was prepared by the Research Division, Miles Laboratories, Inc., Kankakee, Illinois. Analyses were performed by R. G. Christensen, A. Cohen, R. Deardorff, R. Durst, H. Hertz, B. Howell, S. Margolis, J. Maurey, D. Reeder, L. Sniegoski, W. Yap, P. Verdier, and H. L. Wagner.

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

Washington, D.C. 20234
December 31, 1979
(Revision of Certificates
dated 3-16-77 and 7-18-77)

George A. Uriano, Chief
Office of Standard Reference Materials

(over)

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

This material is for use as a standard in clinical chemistry. It is intended for use primarily as a reference standard for assays of total protein by colorimetric methods. A biuret method [2], modified to a 60-minute incubation, was employed to assay the comparison solutions prepared from SRM 926, and the standardized ampouled solution. It is suggested that this biuret method be used to standardize laboratory-prepared protein solutions and "normal" serum pools. Such standardized "normal" sera could then be used to calibrate refractometers or other instruments for serum protein estimations. Standard Reference Material 927 may be used for other procedures, such as gel diffusion, amino acid analysis, electrophoresis, nitrogen assays, or other tests which require well-characterized protein.

WARNING

This Standard Reference Material is not to be used in standardizing dye-binding tests, for directly checking precalibrated refractometers, or as an immunochemical standard. It is not recommended for use in billirubin standardization.

Protein solutions of lower concentration may be prepared by transfer of the appropriate aliquot to a 25-mL volumetric flask and diluted. Diluents are not furnished with the Standard Reference Material. An aqueous diluent, such as 0.15 mol/L sodium chloride solution, may be used.

This Standard Reference Material is supplied to the user in sealed ampoules. It must be stored such that the temperature of the solution does not exceed 4 °C; nor may the solution be allowed to freeze. Once an ampoule is opened, the solution should be used promptly. Storage of opened ampoules is not recommended. Under proper storage in sealed ampoules this SRM is expected to be stable for 3 years. Stocks of this SRM kept at NBS will be monitored and if degradation is evident, purchasers will be notified. It is recommended that this material not be used after 3 years from date of purchase.

References:

[1] Standardized Protein Solution (Bovine Serum Albumin), Approved Standard: ACC-1, National Committee for Clinical Laboratory Standards, Villanova, Pa., 1972.

[2] B. T. Doumas, Standards for Total Serum Protein Assays - A Collaborative Study. Clin. Chem. **21** (8), 1159-1166 (1975).

[3] United States Pharmacopeia, 18th Revision, p. 855, Class A, United States Pharmacopeial Convention, Rockville, Md. 1970 (see also 19th Revision, p. 712, 1975).

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:

Office of Standard Reference Materials
Room B311, Chemistry Building
National Bureau of Standards
Washington, D.C. 20234

The date of issuance and certification of this Standard Reference Material was March 16, 1977.