U. S. Department of Commerce
C. R. Smith
Secretary

National Bureau of Standards
A. V. Astin, Director

Certificate of Analysis

Standard Reference Material 914

CREATININE

This Standard Reference Material is certified as a chemical of known purity for use in the calibration and standardization of procedures employed in clinical analysis.

Purity	99.8	percent
Volatile matter	0.03	percent
Chloride	0.07	percent
Ash	0.003	percent
Insoluble matter	0.001	percent

The value of the purity has an estimated inaccuracy of 0.1 percent.

The creatinine used for this Standard Reference Material was obtained from the Pfanstiehl Laboratories, Inc., of Waukegan, Illinois. Analyses were performed by D. A. Becker, R. F. Brady, Jr., M. M. Darr, T. E. Gills, R. A. Paulson, W. P. Schmidt, and R. S. Tipson of the Analytical Chemistry Division.

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

The technical and support aspects concerning the 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
September 24, 1968

W. Wayne Meinke, Chief
Office of Standard Reference Materials

(over)

The homogeneity of the creatinine was determined by paper, thin–layer, and gas–liquid chromatography.

Volatile matter was determined by measurement of loss of weight of the creatinine after heating for 24 hours at 110 °C.

Phase–solubility analysis [1] of an oven–dried sample of the Standard Reference Material, with absolute methanol as the solvent, indicated the purity to be 99.82 weight percent. Phase–solubility analysis of the undried creatinine with 95 percent methanol, and 95 percent ethanol, indicated purities of 99.81 and 99.76 weight percent, respectively. Potentiometric titration of the Standard Reference Material required 99.82 percent of the theoretical amount of hydrochloric acid.

The certified value for chloride was obtained by titration with mercuric nitrate of a solution of the products resulting from an oxygen–flask combustion of the Standard Reference Material.

The ultraviolet absorption spectrum of a solution of the creatinine in water showed an extinction coefficient (ϵ_{max}) of 7140 ± 30 at 234 nm. The measure of uncertainty is the standard deviation of a single measurement, and should not be considered to be a certified measure of inaccuracy for the extinction coefficient. Infrared absorption and nuclear magnetic resonance spectra provided no evidence of impurities.

An emission spectrometric analysis for metallic constituents in the ash from this Standard Reference Material showed the following present as major constituents: silicon, aluminum, sodium, titanium, iron, and magnesium. Neutron activation analysis of the bulk Standard Reference Material indicated the presence of the following approximate concentrations of elements: chlorine, 330 ppm; copper, 0.2 ppm; manganese, 0.07 ppm; sodium, 30 ppm.

[1] Mader, W. J., 'Phase–Solubility Analysis" in Organic Analysis, Vol II, Interscience Publishers, Inc., New York, 1954, p. 253.