

National Bureau of Standards

Certificate

Standard Reference Material 136d

Potassium Dichromate



Oxidimetric Standard

This Standard Reference Material consists of highly purified potassium dichromate and is intended for use in oxidimetric standardization. It conforms to the American Chemical Society specifications for analytical reagent grade material, and meets the primary standard criteria of the Analytical Chemistry Section of the International Union of Pure and Applied Chemistry [Analyst, 90, 251 (1965)].

Oxidimetric Assay 99.9931 \pm 0.0036 weight percent

The above uncertainty is a 95 percent confidence interval for the mean, based on 17 degrees of freedom, and includes a contribution of 0.0008 weight percent from all known sources of possible systematic error.

The material in this lot of potassium dichromate is homogeneous within the bounds of the random error uncertainty of the measurement process. Stereo and polarized light microscopic examination of SRM 136d, Potassium Dichromate, revealed no significant particulate contamination and only a small number of fluid inclusions.

COULOMETRIC ASSAY: The certified oxidimetric assay of SRM 136d, Potassium Dichromate, is based on the absolute coulometric reduction of dichromate ion in five hundred milligram samples. The coulometric procedure used in this analysis has been described by George Marinenko and John K. Taylor, "High Precision Titration of Potassium Dichromate, J. Res. Nat. Bur. Stand. (U.S.), 67A(5), 543-459, 1963 September-October.

The molecular weight of $K_2Cr_2O_7$ used in all calculations is 294.1844, the density used in computing its mass in vacuum is $2.69 \text{ g}\cdot\text{cm}^{-3}$, and the value of the Faraday constant is $96486.5 \text{ A}\cdot\text{sec}\cdot\text{mol}^{-1}$.

The electrochemical equivalent of $K_2Cr_2O_7$, SRM 136d, was determined to be $0.508197 \pm 0.000014 \text{ mg}\cdot\text{C}^{-1}$, where the uncertainty represents the 95% confidence interval for the mean based on 17 degrees of freedom.

DRYING: The assay is based on material dried at 110 °C for 6 hr and stored in a vacuum desiccator over magnesium perchlorate.

This lot of potassium dichromate was prepared by Mallinckrodt Inc., St. Louis, Mo.

The experimental sequence was developed by Keith R. Eberhardt of the Statistical Engineering Division, who also statistically evaluated the results. The coulometric analyses of the material were performed by George Marinenko of the Inorganic Analytical Research Division. The microscopic examination was made by Eric B. Steel of the Gas and Particulate Science Division.

The technical and support aspects involved in the procurement, certification, and issuance of this Standard Reference Material were coordinated through the Office of Standard Reference Materials by R. W. Seward.