

National Bureau of Standards

Certificate of Analysis

Standard Reference Material 2677

Beryllium and Arsenic on Filter Media

This Standard Reference Material (SRM) is intended for use as standards for the determination of beryllium and arsenic in industrial atmospheres. SRM 2677 consists of two sets of four membrane filters of a mixed cellulose ester type. Each set contains one each of the filters identified in Table 1. The blank filters are provided for use in assessing the analytical blank. The filters are 37mm in diameter and have a pore size of 0.8 μm . Certified values for the beryllium and arsenic for the three levels and for the blank are given below in Table 1.

Table 1

Filter ID.	Metal content, $\mu\text{g}/\text{Filter}$	
	Beryllium	Arsenic
Series I	0.052 ± 0.003	0.103 ± 0.005
Series II	0.256 ± 0.013	1.07 ± 0.05
Series III	1.03 ± 0.05	10.5 ± 0.5
Blank	<0.001	<0.002

The certified values for As are the means of the values calculated from the gravimetric data and the results obtained by inductively-coupled plasma (ICP) spectrometry. The certified values for Be are based on gravimetric data only and were confirmed by atomic absorption spectrometry (AAS). The listed \pm uncertainties are two standard deviations of the mean. The Be uncertainty values were conservatively set at $\pm 5\%$ to be in line with that of As.

The filters are identified as Series I, II, III, and Blank and are separately encased in plastic petri dishes. This identification is printed on the outside of each petri dish. Each petri dish contains duplicate membrane filters each having the designated amount of beryllium and arsenic on it.

Note: In all instances, an entire filter must be dissolved for each set of measurements as the metals may not be uniformly distributed on the filter.

Each of the filters, containing the added elements, was prepared by depositing onto it 50 μL aliquots of composite solutions of As and Be and drying. The composite solutions were prepared gravimetrically by mixing together appropriate amounts of a standard beryllium solution (prepared from the high-purity Be metal) and a standard arsenic solution (prepared from SRM 83d, As_2O_3). In the preparation of the arsenic standard, As^{+3} was oxidized to As^{+5} with bromine and should be present on the filters as arsenate. The blank filters were prepared by adding 50 μL aliquots of the dilute mixed acid (HNO_3 and H_2SO_4) solution to each filter.

SRM 2677 was prepared in the Inorganic Analytical Research Division. Preparation was performed by R. W. Burke, T. A. Butler, and T. A. Rush. AAS and ICP analyses were performed by T. A. Butler, D. M. Mo, T. C. Rains and T. A. Rush.

The statistical assessment of the certification data was performed by R. C. Paule of the National Measurement Laboratory.

The technical and support aspects involved in the certification and issuance of this Standard Reference Material were coordinated through the Office of Standard Reference Materials by T. E. Gills and L. J. Powell.