National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material 2676d

Metals on Filter Media

This Standard Reference Material (SRM) is intended primarily as an analytical standard for use in the determination of selected toxic metals in industrial atmospheres. SRM 2676d consists of a set of six (6) membrane filters each containing known amounts of cadmium, manganese, lead, and zinc at three levels plus two blank filters. The certified metal content for each level is given in Table 1. The values for the blank filters are not certified but are given for information only.

The certified values for the cadmium, manganese, and lead is the average of the results from Inductively Coupled Plasma Mass Spectrometry (ICP-MS) and the amount added from the composite standard solution used in the preparation of this SRM. For zinc, the certified values are based solely on the measurements from ICP-MS since there is a significant amount of zinc present in the filter membrane.

Table 1

Metal content, μg/filter

Filter I.D.	Cadmium	Manganese	Lead	Zinc
Id	0.97 ± .02	2.09 ± 0.03	7.44 ± 0.10	10.17 ± 0.13
IId	2.81 ± 0.04	9.83 ± 0.14	14.82 ± 0.26	49.47 ± 0.73
IIId	10.04 ± 0.20	19.83 ± 0.38	29.77 ± 0.61	99.31 ± 1.77
Blank	(<0.0005)	(<0.0005)	(<0.0005)	(0.26 ± 0.10)

Each uncertainty is based on a 95% confidence, 95% coverage tolerance interval for the certified value. The interval includes both measurement and material variability, and should cover the true metal content in 95% of the filters, with 95% confidence.

The membrane filters are mixed esters of cellulose acetate and nitrate. Each filter containing the added metals was prepared by depositing onto the membrane surfaces a fixed volume of a composite solution. The composite solution was prepared by dissolving high-purity metals, cadmium, manganese, lead, and zinc in dilute nitric acid. The blank filters were prepared by depositing onto the membrane surfaces a fixed volume of blank solution, dilute nitric acid.

The filters are packaged in plastic petri dishes, and are labelled Id, IId, IIId, and Blank. Each petri dish contains duplicate membrane filters at each of the certified levels in Table 1.

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

SRM 2676d was certified in the NIST Inorganic Analytical Research Division by E.S Beary and P.J. Paulsen.

Gaithersburg, MD 20899
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William P. Reed, Chief
Standard Reference Materials Program

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The statistical assessment of the certification data was performed by S.B. Schiller of the NIST Statistical Engineering Division.

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