



# National Institute of Standards & Technology

## Certificate of Analysis

### Standard Reference Material 3087

#### Metals on Filter Media

This Standard Reference Material (SRM) is intended primarily for use in evaluating and calibrating analytical methods and instruments used for the determination of toxic metals in industrial atmospheres. SRM 3087 consists of six membrane filters of a mixed cellulose ester type, each spiked with a composite standard solution containing nine elements (Ba, Cd, Cr, Fe, Mg, Ni, Pb, Se, and Zn). Five blank filters are provided for use in assessing the analytical blank. The filters are 37 mm in diameter and have a pore size of 0.8  $\mu\text{m}$ .

The certified concentration values, given in Table 1, are based on gravimetric measurements made during the production of the composite solution used to impregnate the filters and on measurements of the amount of stock solution deposited on the filters.

Table 1

Analyte	Material	Purity	$\mu\text{g}/\text{Filter}$
Ba	Barium Carbonate	(99.99 <sup>+</sup> %)	25.88 $\pm$ 0.29
Cd	Cadmium Metal	(99.999 <sup>+</sup> %)	15.50 $\pm$ 0.17
Cr	Chromium Metal	(99.99 <sup>+</sup> %)	10.33 $\pm$ 0.12
Fe	Iron Metal	(99.99 <sup>+</sup> %)	25.84 $\pm$ 0.29
Mg	Magnesium Metal	(99.99 <sup>+</sup> %)	25.83 $\pm$ 0.29
Ni	Nickel Metal	(99.99 <sup>+</sup> %)	25.86 $\pm$ 0.29
Pb	Lead Metal	(99.995 <sup>+</sup> %)	41.33 $\pm$ 0.46
Se	Selenium Metal	(99.995 <sup>+</sup> %)	25.84 $\pm$ 0.29
Zn	Zinc Metal	(99.999 <sup>+</sup> %)	103.3 $\pm$ 1.2

The listed  $\pm$  uncertainties are expressed as two standard deviations for a single filter, and include the uncertainties of the stock solution used in the preparation of the filters.

The spiked filters and blanks are packaged separately in plastic petri dishes. The identification of the filter is printed on the outside of each petri dish.

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 filter containing the metals was prepared by depositing 50- $\mu\text{L}$  aliquots of an appropriate composite solution onto the filter, followed by drying. The composite solution was prepared gravimetrically by dissolving accurate weights of high purity metals or salt in nitric acid. A listing of the purity of the elements is also given in Table 1. The blank filters were prepared by adding 50- $\mu\text{L}$  aliquots of the dilute mixed acid solution ( $\text{HNO}_3$ ) to each filter.

SRM 3087 was prepared and certified in the Inorganic Analytical Research Division by T. A. Butler, T. C. Rains, T. A. Rush, and L. J. Yu. 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 Standard Reference Materials Program by T. E. Gills.

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William P. Reed, Acting Chief  
Standard Reference Materials Program