April 26, 1983
D-585-4-3-53
68-01-6699

Ms. Linda Y. Boornazian, DPO
U.S. Environmental Protection Agency
Sixth and Walnut Streets
Philadelphia, PA 19106

Subject: Letter Report
F3-8303-35
Air Monitoring Technology for Mercury

Dear Ms. Boornazian:

Submitted herewith is a letter report for reviewing available technology to monitor air for mercury at levels between 0.1 and 1.5 ug/m^3. These detection levels are in keeping with EPA's suggestion of 1 ug/m^3 maximum for public long-term average exposures.

Based on this review, it is concluded that the method of choice would be a technique which uses hopcalite-filled glass tubes as the collection medium, with air drawn through the samples by means of battery-powered portable pumps. This method is recommended over other available methods because of its high detection sensitivity and the simplified sampling and analytical procedures. Another advantage is that NIT Region III currently has available five suitable pumps, and tubes can be readily purchased.

To achieve maximum sensitivity with this method, as would be necessary for the low mercury concentrations which would be present in ambient air, a high-volume pump should be used with an 8-mm O.D. tube containing 0.5 gram hopcalite. (This method has been evaluated only for the measurement of elemental mercury vapor. If mercury-containing dust is present, a glass fiber or paper pre-filter should be used and analyzed separately.) The analytical procedure is to dissolve the hopcalite granules in a nitric and hydrochloric acid mixture and analyze by flameless atomic absorption. An article which details this procedure is attached as an appendix. Detection sensitivities in the sub-microgram level (per cubic meter of air) are attainable using the appropriate sampling flow rate and duration.

Other highly sensitive methods use the principle of amalgamation of mercury with silver to collect the vapor. In a technique published in the NIOSH Manual of Analytical Methods, tubes containing two sections of silvered chromosorb P are utilized as the collection medium. Another method collects the mercury vapor on silver wool or gauze. Analysis is generally by thermal desorption and flameless atomic absorption spectroscopy. While the sampling and analytical procedures are somewhat more complex, the detection sensitivity is comparable to that achieved using the hopcalite method.
Another suitable method, similar to the previous methods with respect to sampling and analytical procedures, employs impregnated charcoal as the sampling medium. Prior to use, the charcoal must be heated in a muffle furnace at 600° - 800°C for one hour.

This review is not exhaustive by any means. Several other methods exist, such as the colorimetric dithizone method, portable direct-reading instruments, and indicator papers. However, these methods are found to be less desirable because of the lack of simplicity or lessened detection sensitivity and reliability.

Since FIT Region III currently has the pumps available and hopcalite tubes can be purchased through this office, initiation time once the TDD is written would be one month.

Respectfully submitted,

Laura A. Boornazian

Approved by,

Don Senovich FIT III Manager

LAB/DS/kal

Attachments
Mercury vapor is efficiently trapped from air by passage through a small glass tube filled with hopcalite. The hopcalite and adsorbed mercury are dissolved in a mixture of nitric and hydrochloric acids. Solution is rapid and complete, with no loss of mercury. Analysis is completed by flameless atomic absorption.

Improved hopcalite procedure for the determination of mercury vapor in air by flameless atomic absorption

ARNOLD O. RATHJE and DOUGLAS H. MARCERO
Environmental Control Operation, Lamp Business Division, General Electric Company, Nela Park, Cleveland, Ohio 44112

Introduction

In a previous paper a technique was described for the determination of mercury vapor in air, using hopcalite-filled glass tubes for absorbing the vapor. In this method the mercury was removed from the hopcalite by four successive washings with 50% nitric acid and an aliquot of the combined washings after dilution was analyzed by flameless atomic absorption. This relatively simple procedure has been very useful for personal monitoring and has been utilized for the measurement of hundreds of time-weighted average mercury vapor exposures over the past several years. However, the requirement for repeated washings with nitric acid to remove adsorbed mercury from the hopcalite has been somewhat tedious and time consuming. Furthermore, it has been observed upon occasion that all of the mercury was not desorbed even after four successive washings with acid. Thus, the desirability and advantages of a procedure in which the hopcalite granules and mercury are completely dissolved are obvious.

It has been found that hopcalite can be dissolved very quickly in a mixture of concentrated nitric and hydrochloric acids. This modification of the previously described technique greatly simplifies and shortens the analytical procedure and eliminates any potential for error due to incomplete removal of the mercury from the hopcalite granules by nitric acid washing. The analysis is completed by flameless atomic absorption.

Equipment and Reagents

Apparatus

Two sizes of hopcalite sampling tubes have been used with equal success, depending on the sampling rate employed. For low flow rates (100-250 cc/min.), 6 mm O.D. Pyrex tubes filled with 0.2 gram hopcalite are recommended. For sampling at 1-3 lpm, 8 mm O.D. tubes containing 0.5 gram hopcalite should be used. Using a gas-oxygen blowtorch (available from Fisher Scientific Company, Pittsburgh,

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Douglas H. Marcero is an Industrial Hygienist in the Environmental Control Operation of the General Electric Co., Lamp Business Division. He received his B.S. in Biology from Western Michigan University in 1960 and his M.S. in Industrial Hygiene from the Department of Occupational and Environmental Health, School of Medicine, Wayne State University in 1972.
Pa., Part No. 2-716), heat a section of tubing and pull apart to form a tapered end. Seal the end in the flame. Insert a small tuft of glass wool into the tube and push to the tapered end. Fill the tube with the proper amount of hopcalite, then insert another tuft of glass wool to keep the hopcalite in place. Finally, using the torch, seal the open end of the tube in the same manner as before. With a little practice many tubes can be made in a short period of time.

For personal monitoring, a small battery-powered pump should be used.

A mercury vapor detector or atomic absorption spectrophotometer equipped for cold vapor atomic absorption must be used for the mercury measurement. The apparatus used in our laboratory has been described in a previous paper. A schematic diagram of this equipment is shown in Figure 1.

Reagents

Hopcalite granules: Available from Mine Safety Appliance Company, Pittsburgh, Pennsylvania. A carton containing five vials of this material is sold as Part No. 41566.

Nitric Acid: concentrated reagent.

Hydrochloric Acid: concentrated reagent.

Stannous chloride solution: 20% in 6N hydrochloric acid.

Standard mercury solution: 0.5 microgram of mercury per milliliter of 2% nitric acid. Make up from a stock solution containing 50 micrograms of mercury per milliliter of 2% nitric acid. Both solutions are stable for several months or longer if stored in Pyrex containers.

Sampling Procedure

Select either a 6 mm O.D. sampling tube containing 0.2 gram hopcalite or an 8 mm O.D. tube containing 0.5 hopcalite. Use the smaller tube if a low flow rate (50-250cc/min.) sampling pump is used or the larger tube if the pump operates at 1-3 lpm. In many cases, the choice of pump size is entirely optional. However if maximum sensitivity is necessary, such as for extremely low mercury concentrations as in community air sampling, or for brief operations where sampling time is very short, the larger pump should be used.

Using a glass file, break off the two ends of the hopcalite sampling tube. Tap the end of the tube against a table top or other surface, and if there is an air gap between the hopcalite granules and the top glass wool plug, insert a small clean rod or straigntened paper clip wire into the end of the tube and push the plug up firmly against the granules. (This prevents the possibility of air by-passing the granules as it is drawn through the tube). For personal sampling, mount the tube close to the worker's breathing zone. As a safety precaution, place a short piece of rubber tubing over one end of the filter so that the worker cannot be cut accidentally on the sharp edge of the glass. Connect the other end of the filter to a sampling pump attached to the worker's belt, using small-diameter, lightweight rubber tubing. Sample for a sufficient time to permit an accurate evaluation of the time-weighted average exposure. Seal the ends of the filter with masking tape or plastic caps and transfer to the laboratory for analysis.

Analysis

Pour the hopcalite granules into a 100-ml volumetric flask. Add 5 ml concentrated nitric acid followed by 5 ml concentrated hydrochloric acid. Warm the flask by placing it on a low temperature hot plate for a minute or two to aid in rapidly dissolving all the hopcalite granules. Cool and dilute to the mark with water.

Remove an aliquot of up to 50 ml, depending on the amount of mercury expected in the sample, and transfer to a bubbler flask containing sufficient water to bring the total vol-
volume to 50 ml. Add 1 ml of stannous chloride and immediately connect the bubbler flask to the test apparatus. Drive the mercury vapor through the absorption cell of the detector by passing air or nitrogen through the system at 2 lpm, as described in the previous paper. Observe the peak height of the meter or recorder needle and compare with a standard curve prepared at the same time with known amounts of standard mercury solution. At low concentrations, the peak height is directly proportional to the amount of mercury present so that it is only necessary to run one or two standards for comparison. On the basis of the aliquot size, calculate the total amount of mercury present on the filter. Subtract from the total the amount of mercury obtained on a hopcalite blank analyzed in the same manner.

Results

In order to test the recovery and reproducibility of this method, known concentrations of mercury vapor were prepared in a dynamic calibration system by appropriate dilution of air saturated with mercury vapor. From 2 to 4 samples were taken simultaneously, using battery-operated pumps the same as would be used in workplace sampling. The sampling times ranged from 1 to 8 hours and flow rates varied from 117 cc/min. to 1.96 lpm. The data are shown in Table I. For the 15 samples taken the average recovery was 97.7%, with a standard deviation of 2.6%. This includes any errors that could be due to variability or inaccuracies in the pump flow rates. Also, an error of only 0.2°C in the temperature of the calibration system would cause approximately a 2% error in the expected concentration. Thus, the results obtained by this method were considered excellent.

Discussion

As a check on the absorption efficiency of the hopcalite filter, using the 6 mm O.D. tubing, two filters were connected in series. At flow rates of 117-223 cc/min. and mercury concentrations of 0.069 and 1.21 mg./cu.m., no mercury was detected in the second tubes even after 8 hours. Similar results had been reported in the previous paper with 8 mm tubing containing 0.5 gram hopcalite and at flow rates of 3 lpm or greater.

The hopcalite contains a very small amount of mercury as a contaminant. In lots that we have used, the amount found was generally about 0.4 microgram per gram of hopcalite, or only 0.08 microgram on a 0.2 gram hopcalite filter. A blank should be run on each lot, and by, mixing several vials together a single blank determination will be sufficient for a large number of samples.

Special care must be exercised both in filling the tubes and in handling the tubes during and after sampling to prevent contamination from traces of mercury which may be present on the hands or fingers. The weighing dish and all glassware must be thoroughly clean and free of mercury. Touching of the ends of the hopcalite tubes should be avoided. Since the method is sensitive to nanogram quantities of mercury, even minute traces of contamination could constitute a serious source of error. With proper care, however, these problems can easily be avoided.

No mercury was lost during the solution process, even if the acid mixture came to a boil.

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TABLE I
Results Obtained on Known Mercury Concentrations

<table>
<thead>
<tr>
<th>CONCENTRATION (mg/ml)</th>
<th>SAMPLING RATE (lpm)</th>
<th>TIME (min)</th>
<th>Hg PRESENT (μg)</th>
<th>Hg FOUND (μg)</th>
<th>RECOVERY (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.026</td>
<td>0.133</td>
<td>460</td>
<td>1.66</td>
<td>1.66</td>
<td>100</td>
</tr>
<tr>
<td>0.026</td>
<td>0.194</td>
<td>460</td>
<td>2.37</td>
<td>2.30</td>
<td>100</td>
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<tr>
<td>0.026</td>
<td>0.218</td>
<td>460</td>
<td>2.57</td>
<td>2.48</td>
<td>97</td>
</tr>
<tr>
<td>0.069</td>
<td>0.212</td>
<td>477</td>
<td>7.0</td>
<td>6.7</td>
<td>96</td>
</tr>
<tr>
<td>0.069</td>
<td>0.138</td>
<td>477</td>
<td>4.5</td>
<td>4.4</td>
<td>98</td>
</tr>
<tr>
<td>0.069</td>
<td>0.204</td>
<td>477</td>
<td>6.7</td>
<td>6.5</td>
<td>97</td>
</tr>
<tr>
<td>0.117</td>
<td>0.254</td>
<td>61</td>
<td>1.88</td>
<td>1.94</td>
<td>103</td>
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<tr>
<td>0.117</td>
<td>1.96</td>
<td>61</td>
<td>14.0</td>
<td>13.4</td>
<td>96</td>
</tr>
<tr>
<td>0.251</td>
<td>0.117</td>
<td>453</td>
<td>12.3</td>
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<tr>
<td>0.251</td>
<td>0.222</td>
<td>453</td>
<td>25.2</td>
<td>24.2</td>
<td>96</td>
</tr>
<tr>
<td>0.43</td>
<td>0.261</td>
<td>60</td>
<td>6.7</td>
<td>6.4</td>
<td>96</td>
</tr>
<tr>
<td>0.43</td>
<td>1.96</td>
<td>60</td>
<td>50.6</td>
<td>49.8</td>
<td>98</td>
</tr>
<tr>
<td>1.21</td>
<td>0.212</td>
<td>493</td>
<td>126.5</td>
<td>125</td>
<td>99</td>
</tr>
<tr>
<td>1.21</td>
<td>0.218</td>
<td>493</td>
<td>135</td>
<td>127</td>
<td>98</td>
</tr>
</tbody>
</table>
for a few moments. However, to avoid loss the mercury must be in the oxidized state. For this reason, the nitric acid must be added first, followed by the hydrochloric acid.

Since the analysis is performed on an aliquot of the sample solution, an unlimited range of mercury concentrations can be determined by this technique.

This method has been evaluated only for the measurement of elemental mercury vapor. If mercury-containing dust is present, a glass fiber or paper pre-filter should be used and analyzed separately.

References


Accepted December 2, 1975
Personal Monitoring Technique for Mercury Vapor in Air
and Determination by Flameless Atomic Absorption

ARNOLD O. RATHJE, DOUGLAS H. MARCERO, and DAVID DATTILO
Environmental Control Operation, Lamp Business Division, General Electric Company,
Nela Park, Cleveland, Ohio 44112

A method is described for the collection of air samples containing mercury vapor
and subsequent determination by cold vapor atomic absorption (AA) analysis. The
mercury vapor is trapped in a small glass tube containing hopcalite granules.
Mercury is removed from the hopcalite by treatment with nitric acid. The mercury
is reduced to elemental form with stannous chloride and the determination is com-
pleted by cold vapor atomic absorption, using either an AA spectrophotometer or a
mercury vapor detector. Nanogram quantities of mercury can be measured
accurately, using a minimum of field sampling equipment. Since air sample
volume is unlimited, the method can be applied to a wide range of vapor concen-
trations. In addition to personal monitoring, stack and community air quality
measurements can be performed with this technique.

Introduction

A NEED EXISTS FOR A SIMPLE SAMPLING and analytical tech-
nique for the determination of mercury vapor concentrations in air. While mercury
vapor meters are very useful in many sit-
uations, they are subject to certain limita-
tions and difficulties: (a) they are affected
by other substances in the air such as cig-
arette smoke, dust, and a number of com-
on organic solvents; (b) the meters re-
quire frequent calibration, the accuracy of
which may be affected by temperature vari-
atations; (c) the response is non-linear and
tends to flatten out at elevated concentra-
tions; (d) the meters respond to moment-
to-moment fluctuations in concentration,
making the evaluation of the time-weighted
average concentration very difficult or te-
dious in some cases; (e) they are not suit-
able for personal monitoring. For reasons
such as these, another method of evaluation
is required. If meaningful data on time
weighted average mercury exposures are to
be obtained in many industrial monitoring
applications.

Recently Henderson1 has reported studies
which suggest that personal monitoring of
individuals working with elemental mercury
may reveal exposures significantly higher
than those obtained from time-weighted
samples of the environment. The work of
Bell and his associates2 tends to support
these findings. The cause of these discrep-
ancies may be attributable to the added
contribution of contaminated skin and
clothing to the mercury vapor content of
the "micro-environment" surrounding the
worker. In view of these findings, it is
obvious that in many situations, a reliable
evaluation of worker exposure can be made
only by means of personal monitoring, with
the sampling device as close as practical to
the individual's nose and mouth.

Various chemical methods for the deter-
mination of mercury in air have been used.
Most have used impingers or other types of
bubbler devices containing acidic permanc-
ganate, iodine-potassium iodide, or iodine-
hydrochloric acid as the scrubbing solution.
Analysis is generally completed by a dithi-
zone spectrophotometric procedure, or, more
recently, by flameless atomic absorption. The method recommended in the NIOSH criteria document for mercury involves sampling with an impinger and fritted bubbler in series, each containing acidic permanganate solution, and final analysis by atomic absorption. However, these sampling devices are inconvenient and somewhat bulky for personal monitoring over an extended period of time. Moffitt and Kupel described a method employing small glass sampling tubes filled with specially impregnated charcoal for absorption of mercury vapors. Analysis was accomplished by cold vapor atomic absorption using a sampling boat assembly. More recently, Bell and associates described a personal monitoring technique using a glass tube containing silver wool for collection of mercury. The mercury was removed by thermal decomposition, absorbed in an acid-permanganate scrubber, and subsequently determined by atomic absorption.

This paper describes a very simple device which can be worn conveniently by the worker to sample the air within a few inches of his nose and mouth. The analytical procedure is also simple and rapid and uses no special instrumentation other than a mercury vapor meter or other commercial equipment now commonly used for flameless atomic absorption.

Hopcalite (available from Mine Safety Appliance Company, Pittsburgh, Pennsylvania) has been found to be a very efficient absorber for mercury vapors. In the technique to be described, granules of this chemical are placed in a small glass tube, through which the air is drawn by means of a battery-powered pump. Absorption of mercury vapors is virtually 100% efficient over a wide range of concentrations and sampling rates. For analysis, the mercury is quantitatively removed from the hopcalite by four successive washings with dilute nitric acid. An aliquot of the combined washings is analyzed by flameless atomic absorption.

Equipment and Reagents

Apparatus

The hopcalite sampling tube for absorbing mercury vapors can be made very easily in the following manner: Using a gas-oxygen blowtorch (available from Fisher Scientific Company, Pittsburgh, Pa., Part No. 2-716), heat a section of 8 mm O.D. Pyrex tubing and pull apart to form a taper about 2 cm long. Seal the end of the tube in the flame. Allow to cool, then insert a small tuft of glass wool through the open end of the tube, push to the sealed end with a thin rod or wooden stick, and pack gently. Weigh out 0.50 g of hopcalite granules and pour carefully into the tube. Gently tap the filled tube on a table top several times to facilitate uniform packing. Insert another small tuft of glass wool to keep the hopcalite in place. Finally, using the torch seal the open end of the tube in the same manner as before. With a little practice many tubes can be made in a short period of time.

For general air sampling, any convenient source of vacuum may be used. A small battery-powered pump is convenient for personal sampling.

The apparatus used for determining the mercury has been described in a previous paper. A schematic diagram of this equipment is shown in Figure 1. A mercury vapor detector or atomic absorption spectrophotometer equipped for cold vapor atomic absorption may be used for the mercury measurement.

Reagents

Hopcalite granules: This material can be purchased from Mine Safety Appliance Company.
Company, Pittsburgh, Pennsylvania. A carton containing five vials of the material is sold as Part No. 41566.

**Nitric Acid, 50% aqueous**: Dilute a volume of reagent grade concentrated nitric acid with an equal volume of water.

**Stannous chloride solution**: 20% in 6N hydrochloric acid.

**Standard mercury solution**: 0.5 microgram of mercury per milliliter of 2% nitric acid. Make up from a stock solution containing 50 micrograms of mercury per milliliter of 2% nitric acid. Both solutions are stable for several months or longer if stored in tightly-stoppered Pyrex containers. Do not store the dilute solution in polyethylene, as it loses its strength rapidly in such a container.

**Sampling Procedure**

Using a glass file, break off the two ends of a hopcalite sampling tube. If personal monitoring is to be done, mount the tube close to the worker's breathing zone. A convenient technique is to fasten the tube to a temple of the worker's safety glasses with masking tape. The tube should protrude slightly beyond the front of the glasses. As a safety precaution, place a short piece of rubber tubing over the protruding end of the filter so that the worker cannot be cut accidentally on the sharp edge of the glass. Using a length of small-diameter light-weight rubber tubing, connect the other end of the filter to a small battery-powered pump attached by belt to the back of the worker. Draw air through the sampler at 1 to 3 liters per minute (lpm) for a sufficient time to permit an accurate evaluation of the time weighted average exposure. Seal the ends of the filter tube with masking tape after sampling and transfer to the laboratory for analysis.

**Analysis**

Pour the hopcalite granules into a 100-ml beaker containing 10 ml of 50% nitric acid. Swirl the mixture briefly and allow to stand for several minutes. Decant the supernatant liquid into a 100-ml volumetric flask. Add another 10-ml portion of nitric acid to the beaker, swirl, allow to stand, and decant into the volumetric flask as before. Repeat the procedure until a total of four washings have been made. Dilute the contents of the volumetric flask to the mark and shake to mix.

With a pipet, remove an aliquot and transfer to a bubbler flask containing sufficient water to bring the total volume to 50 ml. Add 1 ml of stannous chloride and immediately connect the bubbler flask to the test apparatus. Drive the mercury vapor into the detecting meter by passing air or nitro-

<table>
<thead>
<tr>
<th>TABLE I</th>
<th>Results Obtained on Known Mercury Concentrations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration (mg/m³)</td>
<td>Sampling Rate (lpm)</td>
</tr>
<tr>
<td>0.042</td>
<td>0.96</td>
</tr>
<tr>
<td>0.080</td>
<td>0.49</td>
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<td>0.99</td>
<td>0.98</td>
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<td>1.14</td>
<td>2.87</td>
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<td>1.61</td>
<td>2.86</td>
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<td>2.86</td>
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<td>2.07</td>
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<tr>
<td>2.58</td>
<td>3.86</td>
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</table>
gen through the system at 2 lpm, as described in the previous paper.\(^a\) Observe the peak height of the meter or recorder needle and compare with a standard curve made with known quantities of mercury. On the basis of the aliquot size, calculate the total amount of mercury present on the filter. Subtract from the total the mercury obtained on a 0.5 gram hopcalite blank analyzed in a similar manner.

**Results**

Two techniques were used to evaluate this procedure. In one, known concentrations of mercury were prepared in a dynamic calibration system by appropriate dilution of a saturated air-mercury vapor mixture. Sampling times ranged from 3 to 365 minutes. The results are shown in Table I.

In a second study conducted under normal field conditions, the results obtained by this procedure were compared with the concentrations measured by a mercury vapor detector equipped with a recorder. The detector had been calibrated by the dynamic system. The comparative data are shown in Table II. The results were generally in good agreement.

**Discussion**

The efficiency of the hopcalite filter was checked at various flow rates up to 6 lpm by pulling known concentrations of mercury vapor through two filters in series. The absorption efficiency was found to be greater than 99%, with all of the mercury on the first filter.

Activated carbon (20 mesh) was tried as an absorber. Limited tests with two filters in series indicated that about 97% of the mercury was collected on the first filter. However, when charcoal was used in measuring known vapor concentrations by the method described, the results were inconsistent and generally low.

A number of different lots of hopcalite have been used in our work. All contained a small amount of mercury as a contaminant. The amount usually ranged between 0.2 and 0.4 microgram per gram of hopcalite. Attempts to remove this impurity by heating the material to 350°C were unsuccessful. Prior washing with nitric acid and subsequent air drying met with only partial success, and introduced an additional tedious step which did not appear to be warranted. The simplest way of correcting for the mercury in the hopcalite is to run a blank determination along with the samples. By mixing several vials of hopcalite together in a larger container, a single blank determination will suffice for a large number of samples.

Although four washings with nitric acid are recommended to assure complete removal of mercury, 90-98% was removed with only two washings and less than 5% remained after three washings. The efficiency of removal after only two washings tended to be highest for large amounts of mercury and least if less than 0.5 microgram of mercury was present.

A minimum digestion time of three minutes per washing was found to be necessary for most efficient desorption of mercury.

Inasmuch as the analysis is performed on an aliquot of the sample solution, this technique permits the evaluation of an unlimited range of mercury concentrations. If the initial aliquot is too small, or too large for the calibration range of the detector, the

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**TABLE II**

<table>
<thead>
<tr>
<th>Present Method (mg/m³)</th>
<th>Detector (mg/m³)</th>
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<tbody>
<tr>
<td>0.09</td>
<td>0.11</td>
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<tr>
<td>0.063</td>
<td>0.075</td>
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<td>0.22</td>
<td>0.21</td>
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<td>0.04</td>
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<tr>
<td>0.037</td>
<td>0.04</td>
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<td>0.025</td>
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</table>
analysis can quickly be repeated on another size aliquot. This is a distinct advantage over other methods in which the entire sample is consumed.

Comments

Because of its simplicity and extreme sensitivity, this method should find application in a variety of sampling tasks involving mercury vapor. It is well suited to stack sampling as well as ambient air quality measurement, inasmuch as minute amounts of mercury can be concentrated from large volumes of air.

The method as described has been evaluated only for the measurement of elemental mercury vapor. No tests have been performed to determine the efficiency of the filter for trapping mercury-containing dust. For mixtures of vapor and dust, the use of a small glass fiber or paper pre-filter, such as that used by Bell et al., may be necessary for collecting the particulates.

References


HPS Joins AIHA Laboratory Accreditation Program

After four years of effort and with the help of a $170,000 contract with NIOSH, the AIHA has launched a program of accrediting industrial hygiene laboratories. Because many of these laboratories conduct radiometric analyses, the AIHA expressed an interest in having the Health Physics Society (HPS) participate in this program. Accordingly, at the recent meeting in Houston, the HPS Board of Directors approved a cooperative arrangement whereby the HPS would:

1. Submit to the Laboratory Accreditation Committee (LAC) of the AIHA a list of three HPS members from which the AIHA would select one or more for appointment to the LAC. In due time the HPS would have three members on this committee.
2. Supply the LAC with a panel of qualified radiological analysts that could be called upon to visit and appraise those laboratories where radiochemical analyses are an important component of their total business.

It is recommended that anyone who is interested in this program contact:

Newton E. Whitman
Coordinator of Laboratory Accreditation
RAS Building-ABE Airport
Allentown, Pa. 18103