

October 2000

## AIHA Accreditations

In July WOHL was among the first group of laboratories to be accredited by AIHA for Environmental Microbiology. There were six laboratories in this first group.

We have also successfully been reaccredited for Industrial Hygiene and Environmental Lead analyses. All three accreditations are valid through 2003.

WOHL is now accredited for all areas and all analytes covered by AIHA laboratory accreditation.

## Metal Working Fluids

WOHL has a new method for METAL WORKING FLUIDS (MWF'S) based on DRAFT NIOSH 524.

Samples are collected on preweighed PTFE filters. A bulk sample of the metal working fluid is needed to determine solubility. Total dust is analyzed, and if results are low ( $0.5 \text{ mg/m}^3$  for total, or  $0.4 \text{ mg/m}^3$  for thoracic particulate) no further analysis is necessary. If results are greater than those listed, or if it is requested, a special extraction procedure is used to determine the total MWF's present. The PTFE filters are extracted with a solvent mixture, which dissolves the MWF's. The weight lost due to extraction is considered MWF's.

MDL for Dust on PTFE =  $25 \text{ } \mu\text{g/sample}$

MDL for MWF =  $25 \text{ } \mu\text{g/sample}$

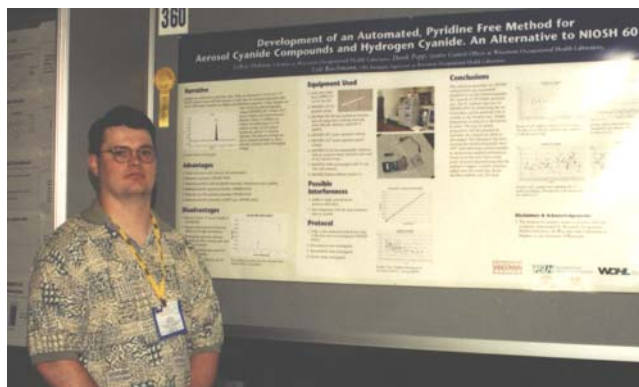
MQL for MWF =  $50 \text{ } \mu\text{g/sample}$

If you have any questions about this procedure please contact the laboratory.

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## POSTER WINS TOP PRIZE



WOHL chemists Leroy Dobson (pictured), Lyle Reichman and Derek Popp presented a poster entitled "Development of an Automated Pyridine Free Method for Aerosol Cyanide compounds and Hydrogen Cyanide, An Alternative to NIOSH 6010" at the American Industrial Hygiene Conference and Exposition (AIHCE) in May at Orlando, Florida. The poster won "Best of Session" and "Best AIHCE Poster" awards. It can be viewed through the AIHA web site or reprints may be requested from WOHL by phone or email.

## Aldehyde and Formaldehyde Sampling

The Wisconsin Occupational Health Laboratory has a number of different collecting media listed for aldehyde and formaldehyde analysis. We perform this testing using two different types of instrumentation in different sections of the laboratory.

The organic section performs testing using gas chromatography according to OSHA method 52. Samples for this type of testing are done on an XAD-2 tube that has been coated with 2-(hydroxymethyl)piperidine. Analysis is performed using a detector specific for nitrogen. This method is applicable for formaldehyde, acrolein and acetaldehyde. The tubes used for collecting the samples have a significant HCHO background which must be accounted for in setting up standards for the method and subtracted from the amount of HCHO found in the samples. This leads to a detection limit that may be affected by this contamination.

The inorganic section performs testing using a HPLC technique that is based on NIOSH method 2016. This method uses a silica gel tube which has been coated with 2,4-dinitrophenylhydrazine (DNPH) as the derivitizing agent. Detection of the derivitized aldehyde or ketone is

accomplished using UV-Visible detection following HPLC separation. The method of derivitizing using 2,4-DNPH is widely used in HPLC for aldehydes and ketones (carbonyls) and EPA method TO11 uses this reagent. The advantage of this method is that it allows a much larger number of related compounds to be collected and analyzed on the same sample. The disadvantage is that the presence of ozone may affect the recovery of the compounds by reacting with them to form compounds that do not show up in the chromatogram as the proper component. This results in an underestimation of the amount of parent compound. To compensate for this, there is a tube available which contains an ozone scrubber component. Another advantage of this method is the availability of a sampling media which allows for much larger air volumes to be collected resulting in the ability to determine much lower levels. This media is routinely used by the laboratory for the monitoring of ozone precursors (TO11 compounds) for EPA in Region 5.

The following table summarizes the compounds analyzed and media used by each section.

Section	Collecting Media	Compounds Analyzed
<b>Organic (GC)</b>	Treated XAD-2 Tube	Acrolein, Formaldehyde, Acetaldehyde
<b>Inorganic (HPLC)</b>	Treated Silica Gel Waters SEP Pak (High Volume)	Acrolein, Formaldehyde, Acetaldehyde, Acetone, Isovaleraldehyde, Propionaldehyde, Butyraldehyde, Crotonaldehyde, Benzaldehyde, Hexanaldehyde, Methyl Ethyl Ketone, Valeraldehyde, 2,5-Dimethylbenzaldehyde, o-Tolualdehyde, m-Tolualdehyde, p-Tolualdehyde

### WOHL Sampling Recommendations

#### GC Factors:

1. In those situations where Acrolein, Formaldehyde and Acetaldehyde are the only compounds of interest the GC method may be used.
2. This may be appropriate in those areas where there is a presence of an ozone source which may interfere with the HPLC method.
3. This method is the method used by OSHA.

#### HPLC Factors:

1. In those situations where it is not certain which aldehydes or ketones may be present, the HPLC method may be a better choice.
2. Ozone may be a problem if present at high levels for this method.
3. The HPLC method may be better for collecting a larger sample volume.
4. For one or two compounds, the GC method may be more efficient but, for more compounds, the HPLC method is the only one capable of collecting other compounds on the same sample.
5. This method is used by NIOSH and EPA for carbonyl compounds for industrial hygiene and environmental sampling.

## Total Spore Count Testing

The Wisconsin Occupational Health Laboratory now offers Total Spore Count testing which determines the identity (to general level) and airborne concentration of non-viable mold fungal spores. Individual allergy sufferers may show symptomatic reactions not only to products of viable mold but to non-viable material as well. Used along with the Andersen Sampler and bulk samples, this new test broadens our ability to adequately assess an area's degree of potential mold contamination and protect occupant health.

Samples are collected on a Zefon Air-O-Cell™ cassette at a flow rate of 15 lpm for 10 minutes. As numerous factors influence the timing and degree of mold spore release from one species to another, we recommend that

several samples be taken from the sample site throughout the day. The Air-O-Cell cassette consists of a pre-greased glass slide enclosed by a transparent plastic 2-piece housing. Air is drawn through an inlet slit in which particles impact the sticky grease. Upon receipt of the cassette at the Wisconsin Occupational Health Laboratory, the glass slide is removed from the cassette and prepared for analysis. Analysis is done by scanning the slide numerous times with a polarized light microscope magnified 1000X. The identified genus of each mold fungal spore encountered, its count, as well as the total count of all mold fungal spores are tabulated. From this data, total- and species-airborne concentrations are calculated and reported to the client.

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The American Academy of Allergy, Asthma and Immunology (<http://www.aaaai.org>) publishes the following guidelines for interpreting fungal spore concentrations:

Low Exposure	Only extremely sensitive individuals may experience allergic symptoms.
Moderate Exposure	Many individuals who are sensitive to these molds may experience symptoms.
High Exposure	The majority of individuals who are sensitive to these molds will experience symptoms.
Very High Exposure	Nearly all individuals with any sensitivity to these molds will experience symptoms. Extremely sensitive individuals may become very sick.

Sample media and collection pumps are available from the laboratory for a nominal cost. Non-viable spores samples collected on greased slides using the Burkard Samplair (TM) pump may also be analyzed by this method. Feel free to contact the laboratory staff to answer any questions you may have.

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## WEB Page

If you have visited the WOHL web page at <http://www.slh.wisc.edu/wohl/> recently, you have seen the online Sampling Guide and downloadable accreditation certificate. We hope to enhance the search capability and expand information available in the online Sampling Guide in the future. Some of the current highlights of the web page are: the online Sampling Guide, lab chain of

custody form, previous newsletters, AIHA accreditation documentation, online media ordering and e-mail directories.

We continue to seek ways of improving service to clients. To make input more convenient we relocated links to the survey form to a more prominent position on the web page. Let's hear from you on how well we are meeting your needs.