

INDUSTRIAL HYGIENE ACTIVITIES REPORT
DOW CHEMICAL U.S.A.

DECEMBER, 1980

HIGHLIGHTS

Production Divisions

Engineering controls at the LOUISIANA DIVISION continue to reduce personal exposures (page 1).

The Respirator Fit/Test Trailer Program in the MICHIGAN DIVISION provides an education program and workshop for employees using respirators (page 2).

Consulting services were provided to Dow Latin America by the TEXAS DIVISION Environmental Services Laboratory (page 3).

A description of the WESTERN DIVISION industrial hygiene and environmental control programs aided physicians enrolled in occupational medicine at the University of California (page 4).

Product Departments

Safe handling of Dow pesticide products were the discussion topics in support of AGRICULTURAL PRODUCTS (page 4).

Industrial Hygiene's role in support of ORGANIC CHEMICALS' product stewardship program for ethylene oxide customers was defined (page 5).

USA Laboratory

Long term Draeger chlorine detector tubes showed relatively good accuracy in tests ranging from 2 to 6 hours in duration but at a flow rate approximately three times that recommended by the manufacturer (page 6).

Field tests have shown that despite weaknesses, the Real minimonitor is as accurate as the carbon tube monitoring method for methyl chloride (page 6).

Seven IHGs were approved by the Dow Industrial Health Board at their December meeting (page 6).

The number of certified industrial hygienists in the U.S. Area now totals 35: 17 certified in the comprehensive practice and 18 certified in the core aspects of industrial hygiene (page 7).

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PRODUCTION DIVISIONS

DOWELL DIVISION

Asbestos -- O. F. McDonald

Laboratory tests indicated asbestos was the major component in insulation located at the Tulsa test pit. Additional air sampling is being conducted to determine the airborne concentrations in the area.

DIS Operations Audited -- O. F. McDonald

Dowell Industrial Services (Hominy District) completed a boiler cleaning job and nine water jet jobs this month. Observations indicated little potential for contact between chemical and operator. Actual measurements will confirm this.

LOUISIANA DIVISION

Vent Recovery Control -- T. F. Campbell

Engineering controls have solved a problem which resulted in several medical calls due to residual oil vapor exposure. The residual oil vapors were previously being vented from a fuel oil storage tank. The residual oil vapors are now being controlled by way of a vent recovery system connected to the Division's power plant boilers.

Engineering Controls Successful -- D. L. Kennedy

The recycle chlorine compressor piping at the Vinyl I plant was recently replaced and simplified considerably. Access and maintenance were made easier and the reduction of leak sources results in greater control.

A Full House -- C. E. Halphen

The results are in and Terry Campbell passed the American Board of Industrial Hygiene (ABIH) examination in the Core aspects of Industrial Hygiene. Now all members of the Louisiana Division Industrial Hygiene Laboratory are on their way to being certified.

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MICHIGAN DIVISION

Beware Of Hot Work On Urethane Coated Metals -- R. A. Olson

During a recent salvage operation, hot work on a tank coated with urethane was attempted without adequate surface preparation. The excessive heating on metals coated with urethanes can cause a potential fire hazard and release noxious fumes such as carbon monoxide, nitrogen dioxide, hydrogen cyanide and hydrogen chloride. Removal of the urethane is necessary before hot work on urethane coated metals can begin.

Respirator Protection Education Meeting/Workshop -- T. Repichowski

A combined education meeting and workshop has been designed for employees before participating in the Respirator Fit/Test Trailer. The material presented is geared to aid employees in understanding the federal regulation (CFR1910.134) and Michigan Division Safety Standard S-745. A 16 mm film entitled "Respiratory Protection" gives general DOs and DON'Ts for chemical workers using respirators. The workshop is designed so employees can use a "checklist" approach to ensuring proper selection and working condition of respirators to be used on the job.

TEXAS DIVISION

Catalyst Dust Exposures -- J. R. Sanders

Time weighted average and peak exposure measurements taken at the Market Development Catalyst Plant were acceptable. One exception was during catalyst drumming. One work practice change greatly reduced exposures and recommended improvements in the dust ventilation system further improve this potential overexposure situation.

Methylene Chloride Exposures -- J. Summerlin

A recent evaluation of exposures in a Polyolefin/Polycarbonate Research Laboratory revealed overexposure to methylene chloride due to inadequate ventilation and poor work practices. Recommendations included improved hood design and the importance of performing several common work tasks inside the hood in order to reduce exposure to methylene chloride.

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Dicyclopentadiene And Benzene Exposures -- P. L. Regier

The Aromatics and Dienes Plant takes Light Hydrocarbon Plant bottom streams and, through a series of distillation steps, produces a concentrated dicyclopentadiene (DCPD) product and benzene feedstocks for the Benzene Plant. Monitoring of the DCPD process showed 8 hour average exposures well below the 5 ppm Threshold Limit Value. The highest exposure, 0.5 ppm, was for a pipefitter involved in opening a reboiler. Peak exposures to benzene were in excess of the 10 ppm Ceiling IHG while sampling. A modified sampling procedure was recommended.

Consulting Services For Proposed Dow Terminal -- G. H. Flores

Industrial hygiene consulting services were provided for Dow Latin America during a public hearing in Puerto Rico. The hearing was held to discuss the environmental impact of a proposed Dow caustic terminal; special interest groups have mounted an attack on the construction permit using scare tactics. The Dow plan is to present a discussion of probable concentrations and dispersion in case of a caustic spill, possible toxic effects of these levels on human and aquatic life and the safeguards being employed to avoid spills and human exposure. The initial hearing ended abruptly because the opposing groups were not happy with the Administrative Judge's procedural demands; a continuation was scheduled.

Sulfur Dioxide Tank Truck Unloading -- E. P. Whatley

Monitoring results during a sulfur dioxide tank truck unloading procedure at Chlorine V indicated a potential for short term overexposures to sulfur dioxide as a result of a leaky tank truck valve. Follow up monitoring will be conducted to determine if leaky truck valves are a recurrent problem.

Chloroform Exposures -- D. D. Hicks

Exposure of women of childbearing capability to chloroform is permitted only if the workplace meets established exposure limits. Monitoring of chloroform exposure for the environmental biologist at Environmental Services was conducted while fish and aquatic toxicity studies were performed. Both the 8-hour time weighted average and peak exposure levels were well below acceptable levels (10 ppm).

Hexachlorobenzene Wipe Tests -- R. A. Dommer

Wipe testing for hexachlorobenzene (HCB) at the Perchloroethylene Plant was completed. Amounts per wipe ranged from 0.084 μ g to 1290 μ g total HCB. Preliminary evaluation of the data indicate that floor surfaces and door handles have the greatest amounts of HCB present. While there is no Industrial Hygiene Guide for HCB wipe testing, these data will be used to evaluate future wipe testing in this plant.

WESTERN DIVISION

Conference Chairman — F. D. Axe

Rick Axe was named Industrial Hygiene Program Chairman for the 1981 Western Occupational Health Conference to be held in Monterey, California, in October, 1981.

F. D. Axe, S. S. Scott and H. K. Tobol participated in a program presented to a group of physicians enrolled in the University of California's "miniresidency" in occupational medicine. The program, conducted at the Pittsburg plant site, described the Dow Industrial Hygiene and Environmental Control programs and included a plant tour. A broad range of occupational health matters were discussed with the physicians.

Telone* II Field Application Survey -- H. K. Tobol

Since the federal experimental use permit for Telone II as a post plant for trees and vines has been granted, Dow will be participating with the California D.I.A. and U.S. Public Health industrial hygiene people involved with its application. In a meeting at Davis, Bill Cusick of the California Department of Food and Agriculture (Pest Management Environmental Protection and Worker Safety) outlined the procedures they propose to get the desired information. We agree in principle.

PRODUCT DEPARTMENTS

AGRICULTURAL PRODUCTS

NIOSH Symposium — J. R. Vaccaro

Jim Vaccaro presented "Monitoring for Pesticides in Manufacturing and Formulating Plants," at the NIOSH Symposium on Health Hazards in the Pesticide Formulation Industry in St. Louis, Missouri. In addition, a 5-10 minute videotape was made of a session covering the same topic using an interview format with Jim. Dow will receive a courtesy copy.

Dursban* TC Videotape — J. R. Vaccaro

The safe handling aspects of Dursban TC (termiticide concentrate) were captured on videotape as part of an overall plan to launch the new product. Jim Vaccaro carried the industrial hygiene message.

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FUNCTIONAL PRODUCTS & SYSTEMS

Dowtherm* LF Survey -- R. E. Cook

Airborne concentrations of the major components of Dowtherm LF heat transfer agent (diphenyl oxide and methyl biphenyl) were measured at the GMC Chevrolet Motor Division's Metal Fabrication Plant in Flint, Michigan. Measured concentrations of a mixture of these two components ranged from 0.03 to 0.29 ppm (0.01 ppm to 0.12 ppm diphenyl ether and 0.12 ppm to 0.17 ppm methyl biphenyl) in areas occupied by plant personnel. In areas not normally occupied by plant personnel, concentrations ranged between 0.15 and 0.63 ppm. It was recommended that if employees spend time in these areas, they should wear respiratory protection.

PLASTICS PRODUCTS

Allyl Chloride Measured -- R. E. Cook

An industrial hygiene survey was conducted at Specialty Polymers, Leominster, Massachusetts, in support of sales for allyl chloride. Personal time weighted average exposures to allyl chloride ranged from 1.3 to 1.8 ppm. The current OSHA maximum permissible limit is 1 ppm. Area samples taken in the reactor area ranged from 1.3 to 22 ppm allyl chloride. Local ventilation at the reactor was recommended to reduce concentrations to within acceptable limits.

ORGANIC CHEMICALS

TDI Support Via Surveys -- R. J. Karbowski

Three surveys to evaluate toluene diisocyanate (TDI) exposures were conducted as a continuing part of product stewardship efforts. Leggett-Platt in North Carolina, Marflo and Morristown Foam, both in Tennessee, were monitored for airborne TDI during foam production.

Ethylene Oxide Product Stewardship Program -- J. R. Vaccaro

A major planning session was held to establish Industrial Hygiene's role in the product stewardship program for ethylene oxide customers. The plan includes (1) the validation of an air sampling method for ethylene oxide; (2) an education program stressing safe handling and toxicity of the product; and (3) the scheduling of industrial hygiene surveys for key customers.

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U. S. A. L A B O R A T O R Y

TECHNOLOGY DEVELOPMENT

Chlorine Long-term Colorimetric Detector Tubes -- G. J. Roush

The accuracy of Draeger long-term chlorine detector tubes, Lot #303241, was checked using dynamic exposure conditions. Relatively good accuracy, $\pm 20\%$, was obtained in tests ranging from 1 to 6 hours in duration, after the sample flow rate was increased to 50 cc/min. This sample rate is about three times that recommended by the manufacturer. The sample rate increase also improved the detector tube's sensitivity. The primary drawback to a higher sample flow rate is faster saturation of the moisture adsorbing presection. Saturation, which can be visually checked, reduces the sampling period from 8 to about 5 hours duration, depending on air moisture content.

Real Data on Methyl Chloride -- G. J. Roush

Test results continue to be encouraging for using the Real brand minimonitor for methyl chloride. The accuracy of this chemical dosimeter was compared with that of charcoal tubes during a human volunteer exposure study to methyl chloride. Accuracy of both the dosimeter and tube method are typically $\pm 20\%$ under conditions of steady concentration (10 and 50 ppm), moderate air moisture content and room temperature. Indicated weaknesses in the dosimeter method were saturation of the dosimeter sooner than anticipated and a decrease in accuracy of face velocities in the range of approximately 5 to 30 FPM. The dosimeters also appear to give up a small portion of adsorbed methyl chloride when removed from the exposure chamber and placed in a clean, dynamic atmosphere. In spite of these weaknesses, previous field trials of the dosimeters have indicated they are as accurate as the charcoal tubes and much more convenient.

INFORMATION SERVICES

New IHGs Established -- M. G. Swank

Industrial Health Teams met to review the data for compounds used throughout The Dow Chemical Company. Industrial Hygiene Guide (IHG) documentations were written and recommended IHGs were submitted to the Industrial Health Board at their December meeting. The following seven IHGs were approved.

<u>Compound</u>	<u>Industrial Hygiene Guide</u>	<u>Submitted By*</u>
Acetone cyanohydrin	1 ppm Ceiling-S**	O'Malley/Betso/Brownson
tert.-Butyl catechol	5 ppm-Skin	O'Malley/Betso/Brownson
Butyl stearate	150 ppm	Mattler/Wroblewski/Brownson
Ethylene dibromide	0.5 ppm-S	Skowronski/Ramsey/Kolesar
Irganox 1076	10 mg/m ³	Mattler/Wroblewski/Brownson
Methylene bromide	15 ppm	Patten/Betso/Kolesar
Propachlor	0.5 mg/m ³	Bohl/Burek/Kolesar

*Industrial hygienist/toxicologist/physician.

**S denotes skin contact should be avoided.

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PERSONALITIES

New Faces In Industrial Hygiene — S. J. LaMott

Janice Gibson joined the Industrial Hygiene Office as a junior secretary. Janice transferred from the Marketing Department. She's been with Dow for one year. Welcome aboard!

Bruce Johnson, a college co-op student technologist in the Industrial Hygiene Laboratory for the past three years, left Dow (and Michigan) to pursue his Master's Degree in Chemistry at the University of Florida. Best of luck to Bruce!

Low Evans, a college co-op student technologist from Central Michigan University, transferred from the Toxicology Research Laboratory into the Industrial Hygiene Laboratory. Low is pursuing his degree in Chemistry.

Industrial Hygienists Certified — S. J. LaMott

In 1980, three additional industrial hygienists in the U.S. Area were certified in the comprehensive practice of industrial hygiene and five were certified in the core aspects of industrial hygiene. The number of industrial hygienists in the U.S. Area certified in the comprehensive practice totalled 17 and those certified in the core aspects totalled 18.

Chuck Baldwin of Michigan Division Industrial Hygiene Services, and Stan Dombrowski and Larry Rampy of the U.S. Area Laboratory, passed the comprehensive examination.

Terry Campbell of the Louisiana Division Industrial Hygiene Laboratory, and Dean Branson, Linda Coyne, Kevin O'Malley, Rich Pilny and Roland Wallace of the U.S. Area Laboratory, passed the core examination, the first step to comprehensive certification.

Congratulations to all of these people for a job well done.

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