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Interoffice Communication

To Paul Fetzer

From Tom Grumbles

Date December 30, 1980

Subject Comments on Evaluation of 3-M OVM Passive Dosimeter Badge

Jim Hall and I have reviewed the report on the subject study. The results for EDC are reassuring and certainly justify the use of OVM's for monitoring personnel exposures to EDC. The results for VCM are perhaps not surprising but regardless are somewhat disturbing. Therefore, the following comments will be confined to the VCM results.

From the results of the experiment we certainly would have to agree with your conclusions. Basically, it appears we have a method that is precise, but not accurate, for measurement of VCM air concentrations. However, as you state, it is equivalent with the charcoal tube method.

Whenever personnel monitoring is done to evaluate exposures, there are several issues of concern. The first, but not necessarily most important, is compliance with applicable exposure standards. Charcoal adsorption, via a pump and tube or passive monitor, is recognized to meet the accuracy requirements for monitoring in the VCM standard. So from a compliance standpoint it is clear that we are monitoring with a suitable method.

Another, and more important issue, is the level of exposure at which health effects occur and the ability of monitoring methods to determine employee exposure levels for comparison. As witnessed by your results, charcoal adsorption with current sampling schemes appears not to provide an accurate value for personnel exposure to vinyl chloride. In fact, your experiment results show that it can underestimate exposure levels by more than 50%, at levels in the range of 0.5-5.0 ppm.

DEPOSITION EXHIBIT Grumbly 53 AGB

Assuming the experimental conditions are realistic in terms of field conditions this is a disturbing result. However as stated before, the standard says we shall not allow exposures to exceed 1.0 ppm based on their sampling methods. We are doing this.

From the standpoint of health protection, the worst case is that we may be underestimating employee exposures. The answer to this concern is more involved. Briefly stated, OSHA set the 1.0 ppm standard based on the regulatory policy of "lowest feasible level" of exposure for any identified carcinogen. There are no reported effects of vinyl chloride exposures in the range of 0.5-5.0 ppm. The American Conference of Governmental Industrial Hygienist, the group setting TLV values every year, has set an eight-hour TLV of 5.0 ppm for vinyl chloride. This group is not bound by regulatory policies and sets its recommended values based on scientific evidence only. Therefore if measured exposures of 0.5 ppm were actually in the 1.0-2.0 ppm range, I feel confident that employee exposure levels are well within safe limits.

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Based on the results of this study, I would make the following recommendations:

1. We should continue to use the OVM for measuring personnel exposures while being aware of its limitations.

2. If you have the personnel to do more research next summer, I would suggest you consider a "field" study to verify these laboratory results. Perhaps a personnel sampling scheme of several shortened periods (i.e., 4 two-hour periods) could be devised and these results compared to current eight-hour results to see if there is a true difference or significant underestimation with the eight-hour sampling scheme.

3. With the continuing wide-spread use of passive dosimeters in the industry, I feel these results are important to share. I feel we should give consideration to reporting or publishing these results through an appropriate scientific medium.

Thomas G. Grum[illegible]

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cc: J. J. Hall
J. A. DeBernardi