

CC: D. A. Erdman

T. L. Schrenk

From: J. F. Doughty

I support the change to the new technique. It does a better job of measuring the C-8; it is easier for the operators; and it will save considerable money in the laboratory.

12/30/82

CC: T. M. Kemp
J. F. Doughty
J. R. Evitts
T. A. Foster
D. T. Garza
J. F. Hunt
D. L. Kerbow
D. J. Ruffin
R. D. Sink
R. N. Taylor
P. Thistleton
S. J. Watson

December 28, 1982

TO: D. A. ERDMAN
T. L. SCHRENK
J. F. THOMAS
R. J. ZIPFEL

FROM: R. D. LANYON/J. G. LOSCHIAVO

DETERMINATION OF C-8 IN AIR - TENAX TUBE TECHNIQUE

(References: Laboratory Notebooks No. E25495 and E25510)

It's recommended that the current technique (aqueous-impinger) of determining C-8 levels in air be replaced with the recently developed Tenax tube technique. The Tenax tube technique was developed by R. D. Lanyon of the Analytical Development Group. This new technique more accurately measures total C-8 in air. Additional advantages which would result by using the Tenax tube technique are as follows:

- More efficient measurement of total C-8 in air. The Tenax tube technique measures all of the captured C-8 including C-8 contained in airborne TEFLON® particles. In the aqueous-impinger technique, these polymer particles are probably not "wetted" and, therefore, the C-8 is not extracted into the water.
- More accurate assessment of breathing zone C-8 levels. Good industrial hygiene practice dictates that personal samples be collected near the employee's nose and mouth (i.e., the employee's breathing zone). This has been difficult with the aqueous-impinger technique. A large number of personal samples have been voided (lost) since the employee, upon bending forward, would cause the water to spill out of the impinger and into the sampling pump. To help reduce the number of voided samples, personal samples are being collected at the employee's waist. With the Tenax tube technique, all personal samples can be properly collected in the employee's breathing zone.

ALP002405

EID079282

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- Reduces analytical time by 50%. The new technique eliminates the dilution step, pipet transfer, and freeze drying steps. As a result, analytical costs will be reduced by at least \$12.5M a year. During the first year the Tenax tube technique is used, new sampling equipment would have to be purchased. However, the return on investment will be greater than 100%. Sampling equipment presently used in the aqueous-impinger technique will not go to waste. This equipment can be used by the Environmental Laboratory to perform increasing amounts of air sampling plant-wide. Therefore, this equipment can be transferred (Permanent Inventory Transfer or P.I.T.) to the Environmental Laboratory.
- Improved Plant Operator and Laboratorian acceptance. The Tenax tube technique uses more lightweight and compact sampling equipment. Current use of water as the collection medium would be replaced by solid Tenax absorption material. The sampling equipment used for the Tenax tube technique would be much less cumbersome to wear. Plant Operators being sampled could move freely with no restrictions caused by the sampling equipment. As mentioned before, the Tenax tube technique eliminates the freeze drying steps. As a result, the Laboratorians will no longer have to work with cumbersome dry ice/acetone mixtures as well as the high vacuum equipment.
- Significant reduction in sampling pump maintenance and down time. In the aqueous-impinger technique, water can easily be spilled or sucked into the sampling pump. Extensive maintenance is sometimes necessary to remove the water.
- Reduction in the number of voided samples (each sample is collected over a period of six to eight hours). As previously mentioned with the aqueous-impinger technique, water can be easily spilled or sucked into the sampling pump during the sampling period. This most commonly occurs with personal samples as a result of Operator body motions. If water is sucked or spilled into the sampling pump, the sampling must be repeated on another shift. This can prove irritating to the Operator wearing the equipment. Also, repeat sampling is time consuming.

Since the Tenax tube technique is more efficient than the aqueous-impinger technique in measuring all the captured C-8, higher C-8 levels are expected in certain high-dust areas such as the FEP Clean Rooms (see Table 1). Other areas, however, should not experience any significant increase in C-8 levels as a result of using the Tenax tube technique. Since the two Clean Rooms are already required respirator-use areas, no design or administrative changes should be required as a result of the technique change.

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In summary, the Tenax tube technique more accurately assesses area and personal breathing zone C-8 levels. Changing to the Tenax tube technique will result in cost savings, greater ease of sample collection and analysis, and improved employee acceptance. Also, changing to this new technique should not result in costly design or administrative changes. For these reasons, it is recommended that the currently used aqueous-impinger technique be replaced with the Tenax tube technique.

JGLoschiavo:sd
12/28/82
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Attachment

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