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Title: New occupational exposure limit for formaldehyde: significance for museums

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New occupational exposure limit for formaldehyde: significance for museums.

A new control limit for occupational exposure to formaldehyde has been adopted by the Health and Safety Commission (HSE) and comes into effect from 1st January 1986 (1). The new limit, based on a recommendation by the HSC's Advisory Committee on Toxic Substances, has been set at 2 parts per million (ppm) of formaldehyde vapour (2.5 mgs per cubic metre) in air averaged over any 10 minute period (this is the Short Term Exposure Limit or STEL). For longer exposures, up to 8 hours (the Time Weighted Average or TWA) exposure is identical at 2 ppm or 2.5 mgs per cubic metre in air.

The new control limits will replace the current recommended limits (set at limits identical to the new control limits). Since 1980 concern has been voiced on the possible carcinogenic risk attached to exposure to formaldehyde and, although it was demonstrated that rats exposed to high levels of formaldehyde developed nasal cancers, epidemiological studies to date have not indicated that there is any carcinogenic risk from human exposure to formaldehyde. The overall evidence however is equivocal and HSE regards it prudent to judge formaldehyde as a potentioal human carcinogen.

Formaldehyde vapour is highly irritating to the eyes and mucous membranes at levels above the existing limits and has been shown to cause dermatitis, and a form of occupational asthma in susceptible individuals (2).

To comply with HSE policy, exposure of staff to formaldehyde should be reduced as far below 2 ppm (STEL and TWA) as is reasonably practicable. Health and Safety Executive Guidance Note EH42 describes the monitoring strategies required to gauge staff exposure to toxic substances and gives details of how to go about assessing exposure levels (3). It is however advisable to consult a qualified Occupational Hygienist on all aspects of monitoring and assessment of staff exposure to toxic substances in the workplace. Extant and impending legislation dictates the requirement for the employment of 'competent' persons to carry out such assessments.

The new control limit for formaldehyde exposure should not be construed as excluding formaldehyde from use as a primary fixative for biological specimens. However, wherever use of formalin solution is likely to result in staff exposure at levels near or above the new control limit

it would be advisable to apply standard chemical laboratory operating procedures for toxic substances, namely the use of an effective fume cupboard or fume hood whilst (a) fixing specimens, (b) transfering specimens from formalin to a longer term preservative and (c) examining or dissecting formalin fixed specimens for prolonged periods.

Short term or casual examination of material preserved in dilute formalin should, so long as carried out under controlled conditions, not present any hazards, however, advice should be sought where doubtful from a competent Occupational Hygienist or Safety Officer trained in the monitoring and assessment of exposure to toxic substances.

Simple methods are now available for distinguishing formalin solution from other preservatives, therefore reliance on the use of smell should be discouraged. Waller (4) has devised a colourimetric paper strip indicator which distinguishes solutions of formaldehyde from other preservatives.

References

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2. Health and Safety Executive, Formaldehyde, Toxicity Review 2, 1981, ISBN 0 11 883453 3
3. Health and Safety Executive, Monitoring Strategies for toxic substances Guidance Note EH42, 1984, ISBN 0 11 883600 5
4. Waller, R and McAllister D. A spot test for distinguishing formalin from alcohol solutions. Abstracts of 2nd Workshop on the Care and Maintenance of Natural History Collections May 21-22, 1985, Royal Ontario Museum, Toronto, Canada.

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