

Solvent Toxicity

Most conservators by now must have received the notice from Adam Chemical Company advising that they have discontinued manufacture and sale of Beva 371 because of the toxic nature of its solvent component, which has been toluene or equivalent.

The toxicity of toluene (toluol) has long been known, whether by inhalation or by skin absorption. Its TLV value as established by the ACGIH at present is listed at TWA 100 (ppm). In other words the limit of exposure during an eight hour day would be a maximum of 100 parts of solvent vapor per million parts of fresh air. Since toluene is a cumulative liver poison, periodic short term exposures can be harmful.

The short term exposure limit, (STEL) specifies maximum exposure in ppm for a period of only 15 minutes, with no more than four such periods in an eight hour day, and with at least 60 minutes between each successive exposure. For toluene the STEL rating is 150 ppm. As a rough guide, 100ml of liquid toluene vaporized in a room measuring about 18 x 20 x 8 feet can produce a vapor concentration of 250 ppm. Limits can quickly be reached when cleaning paintings, applying materials dissolved in solvent, or during spraying of varnishes.

Conservators should think about their work system and realize that there are many instances when they are vaporizing undue quantities of toluene or other toxic solvents while remaining in the work place for much longer periods of time than 15 minutes.

Toluene is among the more toxic of substances commonly used in conservation. It should be known that others of the very common solvents used in conservation, turpentine and stoddard are listed as having a TWA of 100, and an approximate STEL of around 150 ppm also. VM&P naphtha, white spirit, and similar aliphatic solvents list at around 300 to 400 ppm compared with isopropyl alcohol at 400, acetone at 750, and ethyl alcohol at 1000. Dimethylformamide, (TWA 10), morpholine, (TWA 20), and pyridine, (TWA 5), are so toxic that they should only be used under a fume hood avoiding skin contact.

Beva 371 and Beva 677 contain 2/3 by volume of toluene, or aliphatic solvent of equal toxicity. But Beva is not the only culprit. Acryloid B72, which has received wide acclaim as a varnish, is a resin dissolved in toluene. Both of these materials require a degree of intimate contact with the toxic vapors that can hardly be avoided. Removal of Beva 371 from paintings after use, and future removal of B72 varnish from paintings also require copious use of toluene.

It is significant that it is an outside commercial interest to finally take responsible action. AIC can take no credit in its failure to establish at least a minimal effort to publish evaluations of materials having proven deleterious effects on paintings should also be available to inform conservators of known hazards to paintings. This kind of data from an authoritative source would do much to dispel misinformation spread by rumor or "old wives tales", and become the start of a source for reliable information available to conservators on request.

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Health & Safety Committee Response

The job of publishing solvent toxicity information for Conservators has been carried out by the Center for Occupational Hazards with grant aid from the National Museum Act and the New York State Council on the Arts.

Mr. Fieux's letter illustrates, however, that solvent toxicity information is not at every conservator's fingertips. The following publications are listed to help the membership gather this important information:

Conservation Hazards Data Sheets, available for \$.25 per page from: Center for Safety in the Arts, 5 Beekman Street, Suite 1030, New York, New York 10038; (212)227-6220.

- A Health and Safety Program for Conservation Laboratories (4 pp)
- Conference on Safe Pest Control Procedures for Museum Collections (packet \$10.00)
- Emergency Plans for Museum Conservation Laboratories (4 pp)
- Ethylene Oxide (Packet \$12.00)
- Fire Safety in the Conservation Laboratory (4 pp)
- Hazards of Dyes and Pigments for Museum Personnel (8 pp)
- Health and Safety for Historic Structures Preservation (8 pp)
- Ionizing Radiation Protection for Conservation Laboratories (8 pp)
- Respirator Use in Conservation Laboratories (6 pp)
- Safe Pest Control Procedures for Museum Collections (8 pp)
- Solvents in Conservation Labs (8 pp)
- Storage and Dispersal of Conservation Chemicals (4 pp)
- Thymol and O-Phenol: Safe Work Practices (4 pp)
- Ventilation for Conservation Laboratories (6 pp)

If more information is needed, I can also recommend to conservators in all specialties the publication: Guy Petehbridge and J. Malcolm Harrington ed., "Safety and Health in the Paper Conservation Laboratory," *The Paper Conservator*, Volume 5 and 6, 1980-81.—Patricia Dacus Hamm, Chair, Health and Safety Committee

Series on Ceramic Technology

The American Ceramics Society in 1985 initiated a series of volumes on ceramic technology, called *Ceramics and Civilization*, edited by W. David Kingery. Three volumes have been published and a fourth will be published this spring. The first volume, *Ancient Technology to Modern Science*, contains articles on technology and style, pottery production in Nubia, Egypt, Greece and articles on Chinese pottery and soft paste porcelain. The second volume, *Technology and Style*, contains articles on Chinese overglaze enamels and pottery, Korean and Japanese pottery, ancient glass, Eskimo ceramic technology, Corinthian amphoras, bricks from Babylon, ancient Near Eastern pottery and pottery from Ban Chang, Thailand. The third volume, *High-Technology Ceramics: Past, Present and Future*, contains articles on Egyptian faience, ancient refractories, Roman glass and concrete, Chinese celadon and the development of European porcelain. These volumes provide a foundation for understanding ancient ceramic technology, and are available through the American Ceramics Society, 757 Brookside Plaza Drive., Westerville, Ohio 43081.

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