Health and Safety

Mothballs Reconsidered

Two chemicals, naphthalene and para dichlorobenzene (PDB), are used in their sublimated, vapor phase as fumigants and insect deterrents in closed collections. They are both commonly referred to as "mothballs" and are often misused to deodorize rooms or deter pest activity in the home environment when the vapor concentration is not controlled. This lack of containment reduces efficacy and increases the hazard to museum staff and to homeowners. Both chemicals are irritating to the respiratory system and eyes and can cause allergies. Both chemicals have identical Threshold Limit Values (TLV), which are very low. Both chemicals also have distinctive odors that can warn people that they are being exposed before the concentrations reach the TLV. Naphthalene has slightly better odor warning properties (0.084 ppm) than PDB (0.18 ppm).

Earlier research has established that PDB is a suspect cancer agent, and has been labeled as such by various agencies. Based on previous studies, these agencies have assigned PDB the following cancer ratings: IARC—possibly carcinogenic to humans, limited evidence; NIOSH—carcinogen, NPT—reasonably anticipated to be a carcinogen; ACGIH—confirmed animal carcinogen with unknown relevance to humans.

Until recently, there was no clear evidence of carcinogeneity for naphthalene because of the lack of sufficient studies. However, recently published inhalation studies indicate that there is clear evidence of carcinogenic activity in both male and female rats based on increased incidences of respiratory cancers (epithelial adenoma and olfactory epithelial neuroblastoma of the nose). These studies suggest that naphthalene is in the same range of toxicity as PDB.

Individuals who work in museums and costume storage areas where naphthalene or PDB has been, or is actively, used should be provided with ventilation and/or respiratory protection sufficient to keep exposure to either of these chemicals as low as possible. Because naphthalene and PDB permeate porous surfaces (like wood cases) and can recrystallize, storage containers may be highly contaminated, suggesting that facilities might consider replacement of "soaked" drawers, cases or other storage materials. These recent findings also suggest that prudent practice might dictate the choice an alternate way to protect collections.

Summarized by members of the Health and Safety Committee from: "ACTS Changes Mothball Recommendation," ACTS FACTS, Feb. 2001, vol. 15, no.02, pp. 2–3 "Toxicology and Carcinogenesis Studies of Naphthalene (CAS No. 91-20-3) in F 344/N Rats (Inhalation Studies)," National Institute of Health, Publication no. 01-4434, National Toxicology Program, http://ntp-server.niehs.nih.gov/cgi/iH_Indexes/LT/iH_LT_Frames.html, search date April 2001.

Toxicity of Mothballs and Mothflakes[a] All conditions are assumed to be 25° Centigrade: both compounds will be more volatile and more concentrated at higher temperatures.

Chemical, CAS Registry Number	TLV(ACGIH) in ppm (inhalation)	PEL(OSHA) in ppm (inhalation)	Acute toxicity (inhalation)	Threshold perceptible odor	Human Low Lethal Dose (oral)	Other
Naphthalene #91-20-3	10	10	2500mg/m^3 (Life threat) = 477 ppm	0.084 ppm	30-100mg/kg, i.e. 5-15g = lethal	Known animal carcinogen; reasonably anticipated human carcinogen. Skin absorption also a major route of exposure; eye & respiratory irritant
Paradichlorobenzene 1,4 dichlorobenzene #106-46-7	10	75	6000 mg/m^3 (Life threat) = 998 ppm	0.18 ppm	220-860mg/kg	Known animal carcinogen; possible human carcinogen. Skin & eye irritant; renal toxicity

[a] Sources include: Olkowski, W. and H. Olkowski, "Clothes Moths...How to Protect Your Woolens" *Common Sense* Pest *Control*, 17 #1 (Winter, 2001):9; *MSDS Enoz Old Fashioned Moth Balls*, Willert Home Products, St. Louis (1994) and *MSDS Enoz Moth-Ice Crystals*, Willert Home Products, St. Louis (1994); *2001 TLVs® and BEIs®*, Cincinnati, Ohio: American Conference of Governmental Industrial Hygienists, 2001.

Ergonomics Standard Dead

Under the Congressional Review Act, Congress has passed, and the President has signed, Public Law 107-5, a resolution of disapproval of OSHA's final Ergonomics Program Standard. OSHA has officially removed it from the Code of Federal Regulations (66FR 204303, 4/23/01, Final Rule: removal)

From: Acts Facts, May 2001, vol. 15, no. 05, p.2

Worth Noting

The American and Italian governments have signed a Memorandum of Understanding to protect pre-classical, classical, and imperial Roman archeological matter. This U.S. action is in response to a request from Italy's government under Article 9 of the 1970 UNESCO Convention on the "Means of Prohibiting and Preventing the Illicit Import, Export, and Transfer of Ownership of Cultural Property." Italy is the first major country to seek cooperation with the United States under the 1970 UNESCO Convention to reduce pillage of archeological sites. The agreement offers the opportunity to engage in a partnership to help protect the cultural heritage of Italy and to enrich American cultural life through research, educational programs, and loans between Italian and American institutions. For additional information, contact Catherine Stearns, U.S. Department of State, Bureau of Educational and Cultural Affairs, at (202) 619-5053 or cstearns@pd.state.gov

AIC 2002: Call for Papers

The 30th AIC Annual Meeting will take place in Miami, Florida, from June 6 to June 11, 2002. The focus of the general session will be the conservation and preservation of public art, artifacts, and architectural spaces. The deadline for submitting abstracts is **August 1, 2001**. Send them to: 1717 K St., NW, Ste. 200, Washington DC 20006; Fax: (202) 452-9328: info@aic-faic.org. If you have any questions, please contact 2002 AIC Annual Meeting Program Chair Albert Albano at [redacted] or [redacted]