

## Structural Fumigants: Methyl Bromide and Sulfuryl Fluoride

Whole-house fumigation is a commonly used technique employed to eliminate a variety of structural pests such as drywood termites, powder post beetles and carpenter ants over the short-term. The house is covered with an impermeable covering and a toxic gas is pumped in. A couple of days later the house is vented, aired and the air is sampled to make sure that the gas has dissipated.

Methyl bromide (MeBr) is an odorless, colorless gas, widely used both as a soil-sterilant and to control wood-infesting insects such as drywood termites, carpenter ants, and powderpost beetles. Recent evidence has shown that MeBr is a direct-acting carcinogen in the rat, where it causes stomach cancer. In humans and animals, death results from pulmonary irritation and edema; non-lethal exposures can produce muscle weakness, abnormal reflexes, visual disorders, head-ache and malaise.

Vikane (sulfuryl fluoride) is another highly toxic and odorless structural fumigant. Very little is known about the toxic effects of Vikane, and even the polyethylene sheeting commonly used to protect articles in the home dur-

ing applications is permeable to the chemical. Residues, consisting of inorganic fluoride, have been found on such soft household goods as rubber, feathers, rayon and wool as long as 40 days after fumigation. Still, these residues are not likely to be toxic.

When used as a structural fumigant, MeBr and Vikane are mixed with another fumigant, chloropicrin, which serves as a warning agent to those handling either gas by irritating the eyes and nose. (Chloropicrin is also registered as a pesticide used to fumigant grain). Under a 1982 data call-in, EPA asked that registrants supplement the extremely deficient data-base on both MeBr and Vikane with new and more complete residue data. Sub-chronic and chronic animal study requirements were waived. Until review of other data is completed, no tolerances exist for residues on food commodities.

A National Institutes of Occupational Safety and Health (NIOSH) study of 103 soil and structural fumigators differentially exposed to MeBr, sulfuryl fluoride, or a combination of the two, shows that fumigant exposure causes subtle neurological

damage. Researchers W. K. Anger et al. found significant impairment of finger sensitivity, increased parasthesias (tingling, loss of feeling) in hands, and decreased memory-related cognitive ability, particularly in the group exposed to both fumigant pesticides. This study provides a prime example of the little-studied problem of "chemical synergism" where chemicals in combination exert effects greater than either alone.

The Anger study suggests that more long-lasting effects of exposure may have been overlooked thus far. The changes noted are so subtle that workers themselves might not readily recognize they had occurred.

Although deaths as a result of exposure to structural fumigants are uncommon, they have occurred. Orkin Exterminating Co. was found guilty August 8, 1988 of violating federal pesticide law on charges connected with the deaths use of Vikane in September, 1986 at a residence in Galax, VA. An elderly couple died days after they reentered their fumigated home. The pesticide applicators were found to have failed to check the air for Vikane residues.

### Pesticides and You

National Coalition Against the Misuse of Pesticides (NCAMP)  
530 Seventh Street, S.E., Washington, D.C. 20003 • 202/543-5450

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