



HUMAN HEALTH RESEARCH PROGRAM

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HUMAN HEALTH RESEARCH SUPPORTS NATIONAL BUY CLEAN PROGRAM

Issue:

Cleaning products are widely used in schools, offices, and homes to keep hard surfaces such as furniture, floors, and toilets sanitary. Some of these consumer products may pose potential health risks. Cleaning products are known to generate emissions that potentially have adverse health effects.

The U.S. Environmental Protection Agency's national buy clean program promotes the purchase of products and services that contribute to healthy indoor environments in schools and identifies effective ways to develop, market, and buy lower risk products. Scientists at EPA's Office of Research and Development are evaluating these cleaners so that schools and building managers can select the least hazardous products and reduce human exposure to these chemicals.

Science Objective:

The objectives of research on hard-surface cleaners are twofold: to identify the major volatile chemicals – that is, those that are easily released into the air – in commercially available products, and to develop screening methods to estimate potential exposures. Scientists identified potential hazardous

chemicals in cleaners by reviewing individual material safety data sheets developed by the product manufacturers, and developing and evaluating models to screen emissions.

The review identified more than 150 chemical ingredients in the 267 cleaning products analyzed. They include hazardous air pollutants (HAPs) such as glycol ethers, hydrochloric acid, and methanol. In addition, other chemical ingredients found in the cleaning products include 28 that are regulated by occupational standards; some of these are potential irritants while others can affect the central nervous system. Through these findings, researchers have concluded that products containing high concentrations of these chemicals are undesirable.

Two models have been developed to screen emissions. The first, called the film model, estimates the potential exposure from the liquid cleaning products applied to hard surfaces such as furniture and floors. The other, the bucket model, estimates exposure to a worker or others due to emissions generated from the product in a bucket or other container used during cleaning. It is recommended that the film model be used as a screening tool to compare

the cleaner products and select less hazardous ones.

Application and Impact:

The results of this research are being used by EPA to develop control techniques guidelines for industrial cleaning solvents.

REFERENCES:

EPA (2005), *Potential Inhalation Exposure to Volatile Chemicals in Water-based Hard-surface Cleaners*, National Risk Management Research Laboratory, Research Triangle Park, NC, Report No. EPA-600/R-05-005, 52 pp.

For more information on environmentally preferable products, visit, http://cfpub.epa.gov/schools/top_sub.cfm?t_id=45&s_id=28.

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