Risk Assessment for Hazardous Waste Comminglers at Various Universities

Presenter(s)
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Abstract Text
A common hazardous waste management practice at universities is the commingling of waste solvents. Volatile organic compound (VOC) exposure data from twelve U.S. universities was utilized to perform a risk assessment using the model employed by the U.S. Environmental Protection Agency (EPA). Chronic and carcinogenic health hazards were identified for the ten most prevalent VOCs. The exposure via inhalation under ventilated and non-ventilated conditions was examined. A comparison of the results assuming minimum and maximum exposure frequencies and durations was also made. All four of the scenarios produces a hazard index (HI) of greater than 1 (3-849), indicating that even when exposure is limited there is the potential for adverse chronic health effects. The HI is extremely high for the high exposure scenarios (718-849). Benzene, chloroform, xylenes, carbon tetrachloride, and methylene chloride represent the greatest hazards when individual chemical pathways are examined. Four of the chemicals (benzene, carbon tetrachloride, chloroform and methylene chloride) have known carcinogenic effects. The results for the low exposure scenario give an excess cancer risk (ECR) between 5-9 x 10^{-4} which just exceeds the acceptable risk for carcinogenic effects. When the ECRs for each chemical are examined individually only chloroform exceeds this range (4-7 x 10^{-4}). The potential for cancer effects are several orders magnitude higher in the high exposure scenario (1.4-2.4 x 10^{-1}) and each individual chemical's ECR also exceeds the acceptable risk. Since solvent commingling is generally performed with both engineering and administrative controls in place, use of air line respirators would be recommended to prevent adverse health effects among hazardous waste workers.

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Presenter Bio(s)

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Cynthia has been Assistant Director in the Environmental Health and Safety Office at University of Illinois at Chicago (UIC) for over seven years. In this position she has oversight for the laboratory safety program, hazardous waste management, chemical safety training, environmental compliance, and other duties as assigned. For four years prior to coming to UIC she worked as a contractor performing environmental site assessments. Her university career started at the University of Illinois at Urbana-

Champaign Division of Environmental Health and Safety where she spent two of her six years there working on a study on pollution prevention in laboratories.

Concurrent to full-time employment, Cynthia is pursuing a Ph.D. in Environmental and Occupational Health Sciences at UIC and this presentation is an outcome of a class project. She is also very excited to be taking an active part in working on sustainability at UIC.