MONDAY

ISEA 2005

15th Annual Conference of the
International Society of Exposure Analysis

Diversity of Exposure Analysis and the Southwest

October 30th – November 3rd, 2005

Westin La Paloma Resort
Tucson, Arizona, USA

ABSTRACT BOOK

Poster Wp Indoor, Residential and Consumer-Product Exposure Assessment

Abstract W-19p

Comparison of Toluene Exposures During Spray Painting Using Various Exposure Models

Julie M Panko,
Kenneth M Unice, Jay L Brown
ChemRisk, Inc.

The European Union recently proposed a consumer market ban on the distribution and sale of spray paints or adhesives that contain toluene in amounts greater than 0.1% by weight. The basis for this decision was a risk assessment which suggested that toluene air concentrations during spray painting would exceed a no observed adverse effect concentration for acute exposures. In this paper we compare and contrast the toluene exposure estimation procedures used by the EU with the results of consumer product exposure models that have been designed to estimate chemical exposures during use of consumer products. The EU employed a simple box model that assumed a certain mass of toluene volatilized instantaneously into a completely sealed room resulting in a concentration of 1,000 mg/m3. This type of exposure estimation is often used for industrial hygiene applications to make estimations of worst case exposures. However, it does not accurately portray a real-world use situation. For comparison purposes, a similar spray painting scenario was modeled using the EPA's Multi-Chamber Concentration and Exposure Model and Exposure Fate and Assessment Screening Tool. This model takes into account chemical specific emission models, interzonal air flow and individual activity patterns. The 1-hour peak air concentration predicted using EPA's models was 143 mg/m3, which is seven times lower than the concentration estimated by the EU. For risk assessment purposes, this concentration results in margin of safety values ranging from 1 to 5 when compared to acute toluene exposure concentrations reported in various human toxicity studies. Given that the models are designed to be health protective and therefore tend to overestimate exposures, it is likely that consumer use of toluene containing spray paint would not present an acute health hazard when used in accordance with manufacturer label directions.