



## **Podium Session 129: Exposure Assessment: New Techniques, New Strategies, New Perspectives**

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### **Benzene Exposures from Petroleum-Derived Solvents Containing Trace Levels of Benzene in Occupational Settings**

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Benzene may be present as a trace impurity or residual component of mixed petroleum solvents due to refining processes. In this presentation, we review the physical and chemical properties of various petroleum solvents and characterize the typical airborne concentrations of benzene associated with the handling or use of low-level benzene-containing products in the United States. Our assessment was based on (1) a review of the benzene content and flammability hazard of various petroleum solvents; (2) a review and synthesis of the publicly available literature on measured airborne concentrations of benzene associated with products that have typically contained <0.1% benzene since the late 1970s or early 1980s; and (3) indoor exposure modeling to predict breathing zone 8-hr time-weighted average (TWA) airborne concentrations of benzene under several hypothetical scenarios involving the use of benzene-containing mineral spirits. Our analysis showed that petroleum-derived products that may have historically contained trace levels of benzene, such as paints and paint solvents, printing solvents and inks, cutting and honing oils, adhesives, mineral spirits and degreasers, and jet fuel, could have produced average TWA airborne concentrations of benzene that ranged from 0.002 to 0.2 ppm under standard use scenarios. Higher air concentrations (up to 1 or 2 ppm benzene) have occasionally been reported for specific products, particularly if the bulk content of the product was unknown (or suspected of being greater than 1%) or the sampling was performed under worst-case solvent use patterns or workplace conditions. The overall weight-of-evidence indicates that only certain low volatility solvents (such as mineral

spirits) can be safely used in spray applications or unventilated workplace conditions. It also indicates that, under nearly all anticipated product use scenarios, petroleum-based products containing <0.1% benzene are not expected to produce 8-hr TWA airborne concentrations that exceed current occupational exposure limits.