differ from the sparse measurements, the posteriors are very similar to the priors. In either case, the posteriors are more reliable than the sparse measurements or the priors.

281.

INDUSTRIAL HYGIENE CONSIDERATIONS FOR ESTABLISHING A JOB-EXPOSURE MATRIX: A CASE STUDY FOR BERYLLIUM WORKERS. G. Day, C. Schuler, A. Velilla, M. Hoover, K. Kreiss, NIOSH, Morgantown, WV; A. Dufresne, McGill University, Montreal, PQ, Canada; M. Kent, Brush Wellman Inc., Elmore, OH.

In 1999, detailed work histories were gathered from 731 of 808 eligible workers at a facility engaged in the primary production of beryllium metal, oxides, and alloys. Workers reported minutes spent in specific tasks throughout an average workday. Workers were also screened for beryllium sensitization and chronic beryllium disease (CBD) as follow-up to a survey conducted six years earlier. Since the previous survey, approximately 95,000 air samples (area, lapel, special, and process) had been collected from more than 500 operations and 76 separate locations. As part of a larger analysis, we are developing a job-exposure matrix (JEM) with the objective of estimating personal exposures to airborne beryllium. Each cell within the JEM comprises average airborne beryllium mass concentration ($\mu g/m^3$) by year for each department, location, and operation combination (area). The quality and consistency of these data were gauged via comparison to estimates from NIOSH research and OSHA inspection data. We then created a data dictionary of consistent descriptors for all areas to serve as a bridge to the work history dataset. Preliminary observations indicated that over this period >90% of all samples were general area samples, and that the proportion of lapel samples increased from <1% in 1994 to >5% in 1999. Data were also analyzed for trends in exposure concentration by area. The JEM developed herein will serve as the basis for evaluating dose-response relationships for beryllium sensitization and CBD in this workforce. The next phase of this project will involve converting estimates of airborne exposure to alternative metrics of exposure that may better reflect the bioavailability of inhaled beryllium. Additional options include assessing (1) physicochemical properties of various forms of beryllium to which workers may have been exposed, and (2) the potential impact of dermal exposure on sensitization.

282.

BREATHING ZONE AND EXHALED BREATH CONCENTRATIONS OF 1-BROMOPROPANE FROM WORKERS EXPOSED TO FOAM ADHESIVES. K. Hanley, NIOSH, Cincinnati, OH; W. Sanderson, University of Iowa, Iowa City, IA.

1-Bromopropane (1-BP) has been marketed as an alternative for ozone depleting solvents and suspect carcinogens and is used for metal, precision, and electronics cleaning; aerosols; and adhesives. Toxicity of 1-BP is poorly understood, but it may be a neurologic, reproductive, and hematologic toxin. Sparse exposure information prompted NIOSH to conduct an exposure assessment using inhalation, exhaled breath, and urinary metabolite measures. One objective is to evaluate exhaled breath concentrations of 1-BP using a field practical collection method. Exhaled breath analysis can be a powerful, non-invasive tool that indirectly estimates inhalational and dermal exposure. Three-liter Tedlar® breath bags were used which contained waste air diverting valves to ensure end-tidal breath collection. Alveolar breath samples were obtained from workers before and after work on two consecutive days and before work on the third day at facilities using 1-BP adhesives to construct polyurethane foam seat cushions. After collection, breath samples were adsorbed on Anasorb CMS synthetic charcoal tubes and analyzed by gas chromatography via NIOSH Method 1025. This strategy allows breath samples to be analyzed by a contract laboratory, thereby eliminating chemical analysis with portable instrumentation in the field. Personal breathing zone concentrations of 1-BP ranged from 45–200 ppm from adhesive sprayers and from 0.8–60 ppm from other jobs. For sprayers, 1-BP breath concentrations ranged from 3.2–22 ppm in the immediate post-shift samples, and from 0.4–4.4 ppm in the 16-hour post exposure (next day pre-shift) samples. Overall, breath concentrations for non-spraying jobs were substantially less than for the sprayers, with a post-shift mean of 5.4 versus 12.6 ppm, respectively. This study demonstrates that respiratory elimination is an important excretion pathway for this solvent, exhaled breath is an effective method to evaluate 1-BP exposure, and skin absorption may be an important route of exposure.

283.

INITIAL FIELD TESTING OF A SYSTEM USING GPS AND NEAR-REAL-TIME MONITORS FOR EXPOSURE ASSESSMENT. J. Hornsby-Myers, L. Lee, M. Flemmer, S. Soderholm, NIOSH, Morgantown, WV; R. Gali, West Virginia University, Morgantown, WV.

Workers in many outdoor occupations move about frequently during a typical day of work. Certain workers, such as agricultural and construction workers, are particularly mobile. The National Institute for Occupational Safety and Health (NIOSH) designed and developed a prototype exposure monitoring system which combines geographical location with up to four real-time sensors and outputs the information to a user-friendly interface. By linking worker location throughout the workday to exposure levels from real-time monitors, Local Positioning System (LPS) units with software processing of data identify and document where to focus exposure analysis and control efforts. Post-processing of LPS researchers, regulatory inspecto safety and health personnel to r intensity and location, reveal hc tify sources, and provide exposi distributions. Focused exposure in tum, should allow a high retu ment, facilitating acceptance an tion, with subsequent reduction: tional injury and disease. This p prototype version of a LPS that designed and developed. Modul that enhances the utility of the s valuable tool to researchers for tification, documentation, analy of exposures was developed to data collected from the prototyp software allows the researcher t time-weighted average or peak with location and frequency of level. Field tests have been con NIOSH's Lake Lynn Laboratory struction sites using the prototy real-time dust monitor, noise m ture probe, and a personal gas n results of the fields tests indicat LPS, sensors, and software are for determining exposures in ou environments.

Risk Assessment

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284.

IDLH DOCUMENTATION R

Maier, Toxicology Excellence f Assessment, Cincinnati, OH; R. Jackson, P. McGinnis, Syracuse Corp., Cincinnati, OH; H. Ahler Cincinnati, OH.

Immediately Dangerous to Li (IDLH) concentrations have bee by the National Institute for Occ Safety and Health (NIOSH) to p against exposure conditions that severe irreversible health effects escape from exposure environm assessments were used primarily recommend respiratory protectic values were often based on limi data, secondary source reported considerations. In 1994, NIOSH the IDLH values and developed criteria for determining IDLH v of the toxicological basis for 35 of the current IDLH values was determine if the existing IDLH tions were consistent with curre cal data. For this critical analysi rating method was developed as ducting the evaluation. Technica were established for selection of studies, evaluation of each study tion of the database for each sub Experimental study protocol and were recorded into a customized

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