data regarding the numbers of HCP stratified by occupational group. Training materials are available online to assist facilities and institutions with successful enrollment in and implementation of this new surveillance system for HCP. The NHSN HCP Safety component will assist participating facilities in developing surveillance and analysis methods that permit timely recognition of HCP safety problems and prompt intervention with appropriate measures. At the national level, the system will aid in monitoring rates and trends, identifying emerging hazards for HCP, assessing risk of occupational infection, and evaluating preventive measures, including engineering controls, work practices, protective equipment, postexposure prophylaxis, and immunization uptake strategies.

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Collaboration Among the Industrial Hygienist, the Occupational Health Nurse, and the Infection Control Professional

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In the past interaction and cooperation between the industrial hygienist , the occupational health nurse (OHN), and the infection control professional (ICP) have not been optimal. A likely problem is a lack of awareness of expertise of other disciplines and the value of cooperation. The IH has expertise in identifying, evaluating, and controlling hazards. The OHN knows the clinical status of the work force, and the ICP has expertise in disease surveillance and identifying infection hazards. In this session, we will identify areas of common interest and describe the ways the IH can work effectively with the other professionals. The most obvious area of mutual interest is the control of airborne infectious disease such as tuberculosis (TB). The ICP may have overall responsibility for TB prevention. However, the OHN has an important role in screening and identifying which employees may be infected, and the IH can play an important role in assuring that barriers are in place to prevent the spread of the disease. The IH also can assist in the outbreak investigation team. Other IH roles include assessment of the use of personal protective equipment in tasks such as endoscopy that present an infection risk; in writing policies such as the Bloodborne Exposure Control Plan that involve overlap between the three disciplines; and in conducting routine tasks such as product evaluation, construction planning, and managing medical waste. In summary, these three disciplines have much to share that is mutually beneficial in controlling morbidity and mortality in a health care setting.

Podium Session 108: Chemical Vapor Sampling and Analysis

Monday, June 1, 2009, 2:00 p.m.–4:40 p.m.
Papers 48–55

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Dynamic Sampling Method for Diacetyl and Acetoin Using Tenax TA Solid Sorbent and (2,3,4,5,6-Pentafluorobenzyl) Hydroxylamine Hydrochloride (PFBHA)

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The research was performed to develop a dynamic sampling method for diacetyl and acetoin based on 10% (w/w) (2,3,4,5,6-pentafluorobenzyl)hydroxylamine hydrochloride (PFBHA) coated on Tenax TA (80/100 mesh). Diacetyl (buttery taste and smell) and acetoin are the dominant flavoring-additive ketones used for microwave popcorn, and both are associated with incidents of *Bronchiolitis obliterans*. Because diacetyl has two carbonyl groups, the monosubstituted and the disubstituted, O-oxime derivatives had to be synthesized to assess the chemisorption of diacetyl onto the coated solid sorbent. The O-oxime of acetoin and mono- and disubstituted O-oximes of diacetyl with PFBHA were synthesized to make standard curves. The yields of the derivatives were 93.9±1.8%, 93.8±4.2%, and 73.8±2.8%, and their purities were 98.9±0.6%, 99.1±0.2%, and 88.8±8.3%, respectively, using temperature-programmed capillary gas chromatography-mass spectrometry by m/z 181 selective ion monitoring. The linear range was 17-32 ng for the acetoin derivative and 2.4-42 ng for the mono- and disubstituted diacetyl derivatives. Five different concentrations (0, 0.1, 0.5, 1.0, 1.5, and 2.0 mg/m^3) of acetoin and diacetyl were generated in Tedlar gas bags by injection of the appropriate mass of ketone in water solvent and using the appropriate air volume. Each gas bag, in triplicate at each concentration, was sampled using a personal sampling pump set at calibrated flow rates of 10 and 50 mL/min. Preliminary results showed that the 50 mL/min flow rate caused breakthrough through a 200-mg front section onto a 50-mg back section at 2.0 mg/m^3. The 2.0 mg/m^3 concentration of acetoin and diacetyl was detected on the front section, with 82±20% and 79±16% recovery, respectively, at 10 mL/min. Similar recoveries were obtained at 1.0 and 1.5 mg/m^3. Both diacetyl and acetoin can be separated and determined by this method from the same air sample.

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An Alternative to Thermosorb/N and GC-TEA for Nitrosamines Determination in Workplace Air

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The goal of this study was to adapt the sampler developed by the Institut National de Recherche et de Sécurité (INRS) of France to propose a more simple sampling device and analytical method for the determination of nitrosamines in air by gas chromatography with nitrogen phosphorus detection (GC-NPD). The sampling was done by drawing air through a sampling train containing two tubes placed in series. The first tube contained sulfamic acid and was acting as a guard to trap amines (potential contaminants to the analysis). Only the second tube, which contained Florisil®, was sent to the lab for analysis. The Florisil was then transferred in a vial, and a liquid-solid extraction was performed with 1.5 mL of acetone containing an internal standard. The extract was then analyzed by GC-NPD using internal calibration to quantify eight nitrosamines: nitrosodimethylamine, nitrosomethylethylamine, nitrosodiethylamine, nitrosodipropylamine, nitrosodibutylamine, nitrosopiperidine, nitrosopyrrolidine, and nitrosomorpholine. The matrix thus obtained with the acetone extraction was much cleaner than the one obtained by the extraction of a Thermosorb/N according to NIOSH 2522 or OSHA 27. A complete validation was carried out, and a LOQ of 0.040 µg per sample was obtained for all eight nitrosamines, which correspond to a concentration in air of 0.06 µg/m^3,assuming a sampled volume of 720 L. The precision obtained for six replicates on five different levels of concentration was in the range of 2.7-5.8 % for the eight nitrosamines. A study on nitrosamines exposure actually taking place in a rubber plant will allow parallel sampling of Thermosorb/N and INRS tubes, and the results obtained will be discussed.

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Passive Air Sampling for Nonylphenol by Solid-Phase Microextraction

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Nonylphenol (NP) is a degradation product of nonylphenol ethoxylates (NPE), which are widely used as the nonionic surfactants detergents. Exposure to NP is suspected to cause adverse effects on growth and the reproductive system. Due to the possible human exposures, the estrogenic activity of NP has raised concerns about human exposure to these compounds,. EPA has mentioned that NP in household cleaning products could be an important source of indoor air pollution. For the assessment of gas-phase NP exposures, sampling with PUF and XAD2 resin are currently the most available. However, solvent desorptions are commonly needed for the techniques, which make the methods inconvenient. On the other hand, solid phase microextraction (SPME) presents many advantages over conventional analytical methods, by combining sampling, preconcentration, and direct transfer of the analytes into a standard gas chromatograph system. Therefore, the purpose of this research was to develop a passive sampler for NP based on the technique of SPME. Known concentrations of NP were generated in gas bags for the validations of SPME diffusive sampler, with an 85-µm PA fiber used. After exposure of NP, the SPME fiber was placed in a 4-mL vial that contained 100 µL of MTBSTFA, with 1% TBDMCS at 45°C for 10 min to allow further derivatization. The headspace extraction of MTBSTFA and on-fiber derivatization with NP were performed at 45°C for 10 min. The derivatives, t-BDMS, were then determined by gas chromatography/mass spectrometry by directly inserting the SPME fibers into the injection port for thermal desorption and analysis. The experimental sampling constant of the designed passive sampler, as well as the effects of different environmental factors on the samplers, also were validated.

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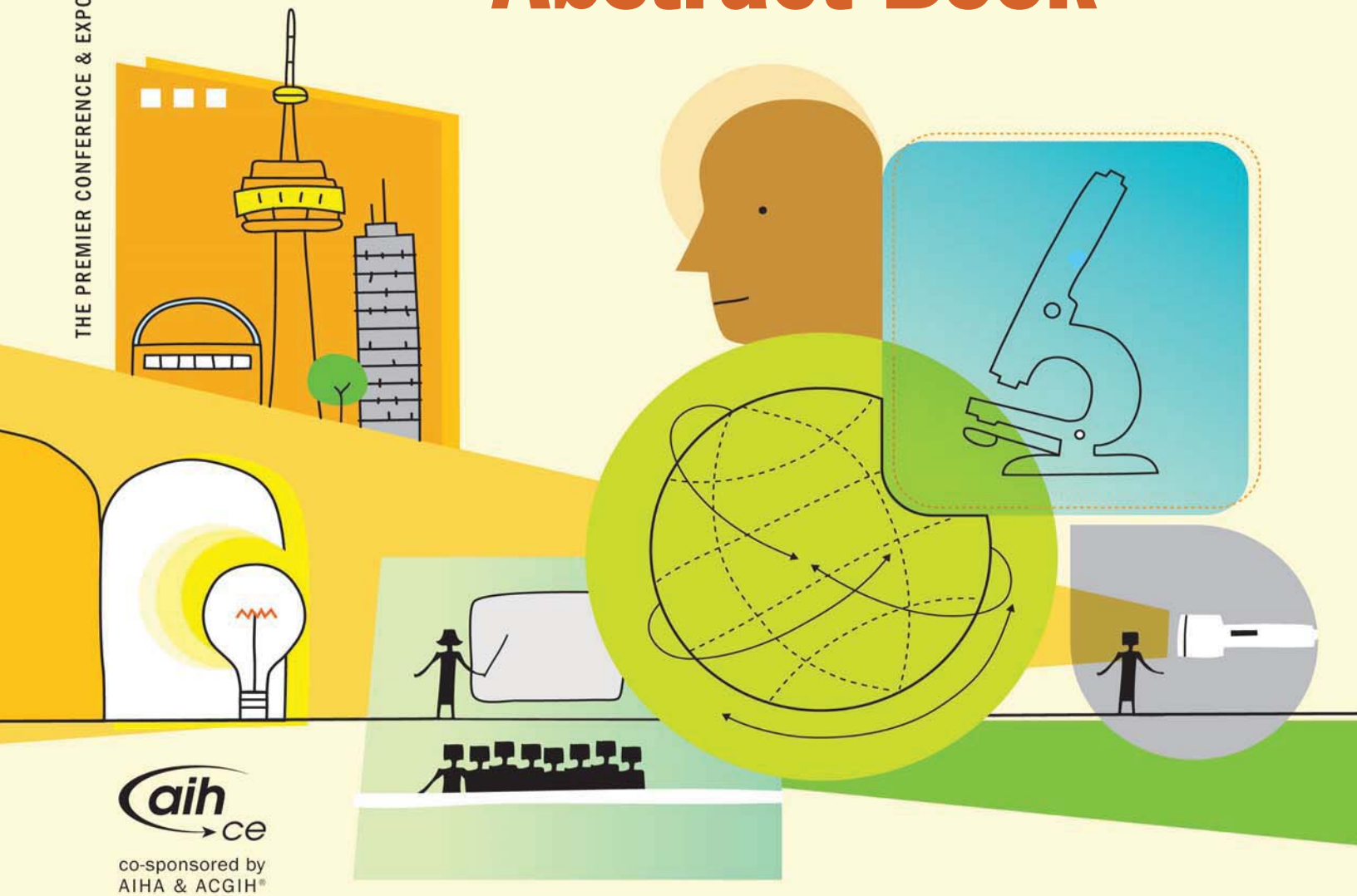

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