Occupational and Environmental Exposures of Skin to Chemicals - 2005

Abstract for Poster 79

Storage Concentration Stability Study of 1- and 2-Bromopropane Spiked Human Urine

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A six week study was performed to verify the concentration stability of 1- and 2-bromopropane (BP) spiked urine samples. Both are volatile solvents believed to be present in urine of exposed workers. 1-Bromopropane (1-BP) is a commonly used industrial solvent, and 2-bromopropane (2-BP) is often found as an impurity component in industrial grade 1-BP. Both are of a health concern for exposed workers because of their chronic toxicity. Central neurological and peripheral neuropathy disorders have been reported in workers exposed to 1-BP; reproductive and hematopoietic disorders have been reported in workers exposed to 2-BP. Human dermal exposure to 1- and 2-BP is of concern by this laboratory, and proper handling and storage of field collected urine samples to preserve these volatile compounds is necessary. Spiked urine stored in glass serum vials with crimped caps and Teflon lined septa at 2-4°C were compared to spiked urine stored in polypropylene tubes frozen at -80 °C, the traditional urine storage technique at this laboratory. The spiked urine samples were assayed by headspace analysis at two and six week time points. In the headspace procedure used, urine samples were diluted with deionized water and placed into a sealed headspace vial. A static-headspace sampler (Teledyne-Tekmar Model 7000) was used to heat each sample at 75°C for a 35 minute equilibrium time. Quantification of the two analytes was by means of a gas chromatograph equipped with a dimethylpolysiloxane capillary column and an electron capture detector. 1-Bromobutane was used as an internal standard for this test procedure. The glass serum vials (n=10) demonstrated full recovery of both analytes after six weeks of storage; 1-BP recovery was 113% and 2-BP was 103% for 2 μg/ml level spikes. The plastic tubes (n=10) had recoveries of 68% for 1-BP and 77% for 2-BP after six weeks of storage.

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This conference follows the success of the first International Conference on Occupational and Environmental Exposures of Skin to Chemicals: Science and Policy, which was held near Washinton, DC, in September, 2002.

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