USING DIFFUSIVE SAMPLERS FOR MONITORING FOR PPB LEVELS OF VOLATILE ORGANIC COMPOUNDS IN INDOOR AIR

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Air sampling typically involves battery-operated pumps with sorbent tubes and desorption with either solvents or heated nitrogen. Although this collection method is highly accurate and reproducible, the equipment can be noisy and cumbersome for the 24-hour sampling commonly used for indoor air environments. In recent years, diffusive samplers have been useful in monitoring indoor environments and ambient air. These samplers are quiet, unobtrusive, and require little training. Their ability to accurately monitor for low levels of volatile organic compounds (VOCs) comes under question because of their low sampling rates and the starvation effects that may be encountered due to low wind velocities in indoor air environments.

This presentation discusses the use of the SKC 575-001 conventional sorbent/solvent badge and the new thermally desorbable SKC 590-100 Ultra Badge. The solvent-based badge is desorbed in situ and analyzed by GC-FID. The sorbent of the Ultra Badge is transferred to a Perkin Elmer tube and thermally desorbed into a GC. Thermal desorption is shown to have much lower detection limits when compared to conventional solvent desorption techniques. The badges were evaluated for their ability to monitor for benzene, toluene, xylenes, acetone, and hexane at ppb levels and for 24-hour periods. Factors such as sampling rate, desorption efficiencies, and reverse diffusion were tested. The sampling rates compare to rates previously validated for 8-hour exposures at ppm levels. Desorption efficiencies at sub-microgram levels range from 91.1 to 112%. Reverse diffusion was significant in some cases and dependent on sampling time. The data indicates that passive monitors can be used effectively to monitor for ppb levels of VOCs commonly found in homes and offices.