

Air Sampling with the CAM 5000

level of pollutants allowable in indoor and outdoor air. To be assured of compliance with air quality regulations, it is frequently necessary to take air samples on a regular basis for analysis. The CDS Analytical Continuous Air Monitoring System (CAM 5000) is engineered to simplify the task of monitoring volatile organic compounds (VOCs) in air. The CAM 5000 is a specifically designed purge and trap unit equipped with a vacuum pump to collect air samples directly onto the trap of the unit, thus eliminating the need for sample collection on sorbent tubes and desorption onto a purge and trap instrument. The CAM 5000 can be interfaced to any GC, and will collect samples either continuously, at timed intervals, or only when manually started. Very low concentrations of pollutants can be detected by increasing analysis time. The instrument can be used as a standard purge and trap unit by turning a valve.

In these experiments, ambient air from

For each sample the vacuum pump was run for 4 minutes at 40 ml/min. Figure 1 is an air sample taken early in the day, before the exhaust fans were turned on. The VOCs present are mostly from the building materials used in the lab. Figure 2 is a sample taken 2 hours after the exhaust fans were started. There is a marked decrease in volatile components in the air after running the fans, and the

quality to improve indicates the fans should be left running all night.

Figure 1

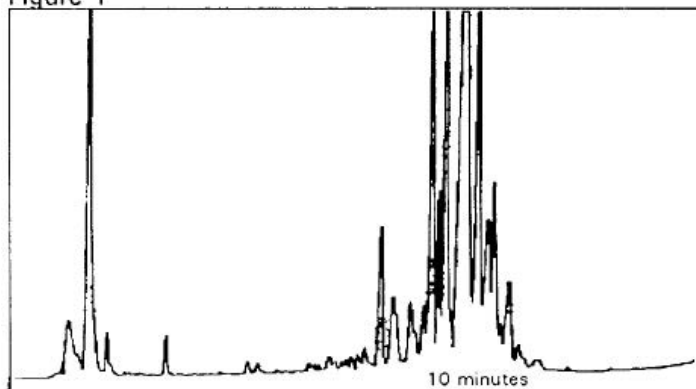


Figure 2

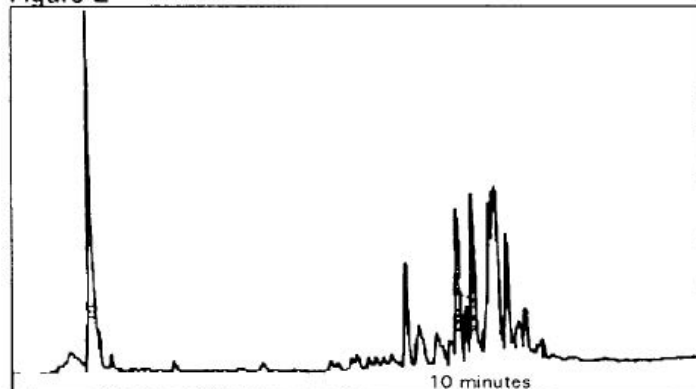


Figure 3

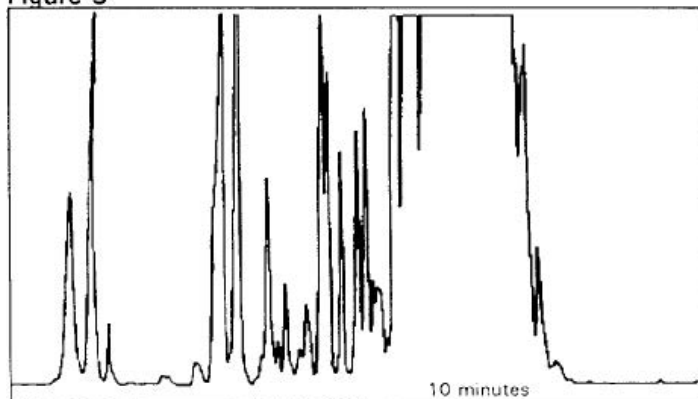


Figure 3 is an air sample taken after 2 ml of charcoal lighter fluid containing petroleum naphtha was placed 2 feet away from the CAM 5000. The sample collection was started immediately after opening the bottle, but the extremely volatile components had already permeated the lab air. The concentration in air was about 6 ppb. For air components at lower concentrations, the sampling time could be increased to allow analysis at the part per trillion level or less.

Figure 4

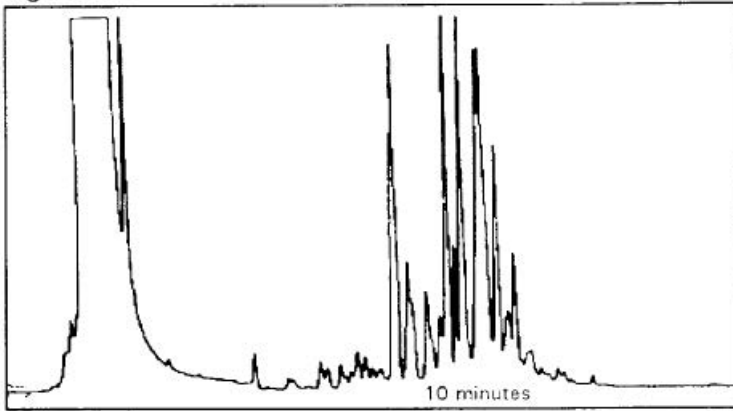


Figure 4 is an air sample taken after rinsing dishes with acetone. The volatilized acetone is apparent as a large peak early in the chromatogram, at a level of about 20 ppb. Other commonly used organic solvents can also be detected, and identified by retention time or by the use of a mass spectrometric detector.

The CAM 5000 is a versatile purge and trap system that simplifies ambient air monitoring. Sample collection can occur automatically or manually. It can also be used for standard purge and trap applications.

Analytical Conditions

A CDS Analytical CAM 5000 interfaced to a Varian 3700 GC with a flame ionization detector was used for these experiments. For each analysis, an air sample was taken for 4 minutes at 40 ml/min vacuum flow. The sample was collected onto a Tenax-silica gel-charcoal trap (an EPA 502.2 Trap) at 35 C, then desorbed onto the GC column at 280 C for 3 minutes. A 30 m, 0.53 mm ID SE54 GC column was used, with the following GC oven program: start at 40 C, hold 2 minutes, then ramp at 8 C/min to 180 C.

FOR MORE INFORMATION CONCERNING THIS APPLICATION, WE RECOMMEND THE FOLLOWING READING:

Air and Water Pollution: A Guide to Federal Regulations. J.J. Keller & Associates, Inc. 1990.

Measurement of Toxic and Related Air Pollutants. Proceedings of the 1990 EPS/A&WMA International Symposium.

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