BUCK Scientific

Application Note #GC3008

Environmental Analysis of Volatile Compounds in Soil, Water and Sludge by GC / PID / DELCD

The analysis of volatile compounds (b.p. $\leq 140°C$) in environmental samples represents contamination from active or recent discharges. EPA methods 502.2, 601, 602, 8010, and 8021 test for pollutants from a broad array of commercial and industrial sources, including gasoline and diesel spills, solvent discharges, and disinfection by-products. The test methods include mixtures of up to 62 individual compounds, and therefore have tremendous power in the identification of these sources.

The analysis is performed using a purge and trap device which separates the compounds of interest from the sample matrix, based on differences in volatility and water solubility. The analytes are identified using very sensitive photo ionization and halogen-specific detectors which respond selectively to the compounds of interest while showing little or no response to other compounds in the sample. Because of the selectivity of the detectors, expensive test methods such as GC-MS are not necessary.

The Buck models 300 and 910 gas chromatographs for volatiles are equipped with a built-in purge and trap, and the unique Buck dry electrolytic conductivity detector (DELCD).

The DELCD does not utilize any solvents, making it extremely easy to operate and very well suited for on-site testing. Since the PID is non-destructive, it is run in series with the DELCD so that aromatic and halogenated compounds are identified simultaneously in one run (illustrated in the chromatographs on the back). The optional FID is also used when analyzing high concentration samples (>750ppb).

Some representative detection limits are shown below, demonstrating the utility and sensitivity of the Buck gas chromatograph.

Analyte	P.P.M.
Benzene	0.0002
Bromodichloromethane	0.0003
Chloroform	0.0004
Chlorobenzene	0.0002
Dibromochloromethane	0.0008
Ethylbenzene	0.0002
Methylene chloride	0.0004
1, 1, 2, 2-Tetrachloroethane	0.0003
Tetrachloroethylene	0.0003
Toluene	0.0002
Total Xylenes	0.0015

Analyst: Kevin Attra