Frysinger, G.S., Gaines, R.B., and Reddy, C.M., *GC×GC: A new analytical tool for environmental forensics*, Environmental Forensics, 2002; v3, 27-34

Comprehensive two-dimensional gas chromatog., GC x GC, is a new anal. tool with a tremendous capability to sep. and identify org. compds. in complex environmental samples. GC x GC uses two different chromatog. columns coupled serially by a modulator to produce a volatility by polarity sepn. and distribute compd. peaks across a two-dimensional retention time plane. The two-dimensional sepn. produces an order of magnitude more resolved peaks than traditional GC methods. Grouping or ordering of peaks in a GC x GC chromatogram facilitates identification of unknown compds. and comparison of complex environmental samples. When a mass spectrometer detector is used, each resolved GC x GC peak yields a single-component, interference-free mass spectrum which leads to accurate matching with mass spectral libraries. GC x GC examn. of marine sediment ext. identified a wide variety of chem. pollutants including polychlorinated biphenyls, p-nonylphenol isomers, polycyclic arom. hydrocarbons, benzotriazoles, alkanes (cycloalkane, alkylbenzene, alkylnaphthalene), and biomarker fractions of petroleum. The two-dimensional GC x GC chromatogram image permits rapid screening of sediment exts. for these and other unknown pollutants.