

PCB Congener Analysis by HRGC/MS

PCB Congeners

Polychlorinated Biphenyls (PCB's) are a complex group of industrial chemicals, whose properties are useful in part because of their resistance to degradation. Unfortunately, this capability has enabled PCB's to become a widespread environmental contaminant throughout the global ecosystem. PCB's are both persistent and bioaccumulative, so they are capable of migrating up the food chain, posing risks to both animals and humans.

Of the 209 PCB Congeners, 14 of the most toxic exhibit a planar structure and are considered to be dioxin-like in their potential toxicity. These compounds are analyzed by EPA Method 1668 and have been assigned Toxic Equivalency Factors (TEF's) relative to dioxin/furan in recent regulatory initiatives. Unlike dioxin however, PCB's toxicity is more widely dispersed throughout the family of compounds, and many of the congeners exhibit toxicity mechanisms and endpoints dissimilar to those attributed to dioxin.

To establish toxicity for complex combinations of these contaminants, the EPA has developed and promulgated Method 1668A capable of determining and quantifying the presence of all 209 PCB Congeners or subsets of those. Both PCB methods utilize isotope dilution combined with HRGCMS analysis to provide the lowest possible detection limits in a wide variety of matrices.

Pace Analytical has been performing method 1668 since its promulgation in early 2001, and added Method 1668A later the same year. With years of experience performing isotope dilution methods by HRGCMS for dioxin and furans, these ultra-trace analyses for PCB Congeners are a natural extension of Pace Analytical's technical capability and analytical expertise.

Sample Matrices

- Soil
- Sediment
- Sludge
- Water
- Air
- Tissue

Testing Capabilities

- 1668 14 Planar PCB's (Who List)
- 1668A 209 PCB Congeners
- TEF/TEQ Quantitation
- Can be combined with Dioxin Analysis for Total Toxicity

Instrumentation

- 2- HRGC/HRMS - Autospec Ultima, High Resolution Mass Spectrometers
- 3- HRGC/HRMS - VG Autospec, High Resolution Mass Spectrometers
- 2- HP 5972 GCMS Low Resolution Mass Spectrometers

Certifications

- USEPA
- NELAC
- Multiple States



The Autospec Ultima HRGCMS by Micromass can quantify Polychlorinated Biphenyls in a variety of matrices to part-per-trillion (ppt) and part-per-quadrillion (ppq) levels.

For more information about Pace Analytical's PCB Congeners capabilities, contact our Specialty Services Group at the Minnesota lab (612) 607-1700 or email SAS@pacelabs.com.

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The Right Solution*®

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