PCB Congeners by GC/ECD

Polychlorinated Biphenyl (PCB) Congener analysis is requested frequently when contamination concerns involve heavier organic compounds.

PCB Congeners are required to be monitored in conjunction with other recalcitrant compounds like dioxins because of their similar behavior. The congeners, specifically the coplanar isomers, have become a recent focus of federal and state agencies. Columbia Analytical Services, Inc. is able to assist clients with this analysis as well as other ultra-trace analyses from their laboratory in Kelso, Washington. Columbia Analytical/Kelso has allocated significant resources in staff, research, and training, as well as instrumentation and facilities to ensure that they can meet project challenges and produce quality data.

To obtain the low level detection limits required when analyzing difficult matrices such as marine sediments, the PCB Congener analysis is performed by following EPA Method 8082 with slight modifications to the sample mass, final extract volume, and cleanups. The extracts are subjected to GPC, mercury, silica gel, acid, and permanganate cleanups prior to GC/ECD analysis. Sample requirements can be found in the Table below. Detection limits can be found in the Table on the reverse side of this information sheet.

	Water	Soil	Sediment	Tissue
Sample Prep/Clean Up Techniques	EPA 3520C EPA 3630C EPA 3660B	EPA 3540C EPA 3640A EPA 3610B EPA 3660B	EPA 3540C EPA 3640A EPA 3610B EPA 3660B	EPA 3640A EPA 3630C EPA 3660B
Containers/ Preservation	1 L Amber Glass w/ 0.008% Na_2SO_3 @ 4°C	8 oz. Clean Wide Mouth Jar @ 4°C	8 oz. Clean Wide Mouth Jar @ 4°C	8 oz. Clean Wide Mouth Jar @ 4°C
Sample Volumes	1 L min. w/o QC; 3 L min. w/QC	30g min. w/o QC; 100g min. w/ QC*	30g min. w/o QC; 100g min. w/ QC*	20g min. w/o QC; 70g min. w/ QC
Holding Times	7 Days to Extract; 40 Days for Extract Analysis	14 Days to Extract; 40 Days for Extract Analysis	14 Days to Extract; 40 Days for Extract Analysis	14 Days to Extract; 40 Days for Extract Analysis
Turn-Around Time (TAT)	3-4 weeks***	3-4 weeks***	3-4 weeks***	3-4 weeks***

* Dry weight basis if limited amounts of sample are available, MRL's will be elevated.

** If not frozen

*** TAT estimates are due to anticipated sample extract clean-up necesary.
Due to variable backlog and project scopes, please check with your project manager for a definitive TAT.

Columbia Analytical Services™

PCB Congeners - Gas Chromatography (GC), EPA Method 8082

Method Detection Limits (MDLs) & Method Reporting Limits (MRLs)

		Water (ng/L)		Soil/Sediment (µg/Kg) (Dry Wt. Basis)		Tissue (µg/Kg) (Wet Wt. Basis)	
Analyte		**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**
PCB 1	2-Monochlorobiphenyl	*	5	*	0.5	*	0.5
PCB 5	2,3-Dichlorobiphenyl	*	5	*	0.5	0.2	0.5
PCB 8	2,4'-Dichlorobiphenyl	2	5	0.2	0.5	0.1	2
PCB 18	2,2',5-Trichlorobiphenyl	2	5	0.06	0.5	0.3	0.5
PCB 28	2,4,4'-Trichlorobiphenyl	2	5	0.07	0.5	0.3	0.5
PCB 31	2,4',5-Trichlorobiphenyl	*	5	*	0.5	0.06	0.5
PCB 33	2',3,4-Trichlorobiphenyl	*	5	*	0.5	0.07	0.5
PCB 37	3,4,4'-Trichlorobiphenyl	*	5	*	0.5	0.2	0.5
PCB 44	2,2',3,5'-Tetrachlorobiphenyl	2	5	0.05	0.5	0.2	0.5
PCB 49	2,2',4,5'-Trichlorobiphenyl	*	5	*	0.5	0.09	0.5
PCB 52	2,2',5,5'-Tetrachlorobiphenyl	1	5	0.2	0.5	0.5	1
PCB 56	2,3,3',4'-Trichlorobiphenyl	*	5	*	0.5	0.2	0.5
PCB 60	2,3,4,4'-Tetrachlorobiphenyl	1	5	0.07	0.5	0.3	0.5
PCB 66	2,3',4,4'-Tetrachlorobiphenyl	0.8	5	0.2	0.5	0.1	0.5
PCB 70	2,3',4',5-Trichlorobiphenyl	*	5	*	0.5	0.2	0.5
PCB 74	2,4,4',5-Trichlorobiphenyl	*	5	*	0.5	0.2	0.5
PCB 77	3,3',4,4'-Tetrachlorobiphenyl	1	5	0.05	0.5	0.3	0.5
PCB 81	3,4,4',5-Tetrachlorobiphenyl	0.7	5	0.1	0.5	0.2	0.5
PCB 87	2,2',3,4,5'-Pentachlorobiphenyl	2	5	0.07	0.5	0.2	0.5
PCB 90	2,2',3,4',5-Pentachlorobiphenyl	0.7	5	0.05	0.5	0.1	0.5
PCB 95	2,2',3,5',6-Pentachlorobiphenyl	*	5	*	0.5	*	0.5
PCB 97	2,2',3',4,5-Pentachlorobiphenyl	*	5	*	0.5	0.06	0.5
PCB 99	2,2',4,4',5-Pentachlorobiphenyl	*	5	*	0.5	0.2	0.5
PCB 101	2,2',4,5,5'-Pentachlorobiphenyl	0.7	5	0.03	0.5	0.2	0.5
PCB 105	2,3,3',4,4'-Pentachlorobiphenyl	1	5	0.09	0.5	0.2	0.5
PCB 110	2,3,3',4',6-Pentachlorobiphenyl	*	5	*	0.5	0.2	0.5
PCB 114	2,3,4,4',5-Pentachlorobiphenyl	0.6	5	0.03	0.5	0.2	0.5
PCB 118	2,3',4,4',5-Pentachlorobiphenyl	0.9	5	0.04	0.5	0.2	0.5
PCB 119	2,3',4,4',6-Pentachlorobiphenyl	*	5	*	0.5	0.09	0.5
PCB 123	2',3,4,4',5-Pentachlorobiphenyl	0.6	5	0.08	0.5	0.2	0.5

		Water (ng/L)		Soil/Sediment (µg/Kg) (Dry Wt. Basis)		Tissue (µg/Kg) (Wet Wt. Basis)	
Analyte		**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**
PCB 126	3,3',4,4',5-Pentachlorobiphenyl	1	5	0.01	0.5	0.2	0.5
PCB 128	2,2',3,3',4,4'-Hexachlorobiphenyl	2	5	0.03	0.5	0.1	0.5
PCB 132	2,2',3,3',4,6'-Hexachlorobiphenyl	*	5	*	0.5	0.2	0.5
PCB 138	2,2',3,4,4',5'-Hexachlorobiphenyl	0.7	5	0.04	0.5	0.1	0.5
PCB 141	2,2',3,4,5,5'-Hexachlorobiphenyl	*	5	*	0.5	0.09	0.5
PCB 149	2,2',3,4',5',6-Hexachlorobiphenyl	*	5	*	0.5	*	0.5
PCB 151	2,2',3,5,5',6-Hexachlorobiphenyl	*	5	*	0.5	0.2	0.5
PCB 153	2,2',4,4',5,5'-Hexachlorobiphenyl	0.5	5	0.1	0.5	0.4	0.5
PCB 156	2,3,3',4,4',5-Hexachlorobiphenyl	0.9	5	0.09	0.5	0.2	0.5
PCB 157	2,3,3',4,4',5'-Hexachlorobiphenyl	1	5	0.2	0.5	0.2	0.5
PCB 158	2,3,3',4,4',6-Hexachlorobiphenyl	0.8	5	0.04	0.5	0.2	0.5
PCB 166	2,3,4,4',5,6,-Hexachlorobiphenyl	0.8	5	0.2	0.5	0.08	0.5
PCB 167	2,3',4,4',5,5'-Hexachlorobiphenyl	1	5	0.4	0.5	0.2	0.5
PCB 168	2,3',4,4',5',6-Hexachlorobiphenyl	*	5	*	0.5	0.2	0.5
PCB 169	3,3',4,4',5,5'-Hexachlorobiphenyl	1	5	0.2	0.5	0.2	0.5
PCB 170	2,2',3,3',4,4',5-Heptachlorobiphenyl	0.9	5	0.06	0.5	0.1	0.5
PCB 174	2,2',3,3',4,5,6'-Heptachlorobiphenyl	*	5	*	0.5	0.2	0.5
PCB 177	2,2',3,3',4',5,6-Heptachlorobiphenyl	*	5	*	0.5	0.3	0.5
PCB 180	2,2',3,4,4',5,5'-Heptachlorobiphenyl	0.6	5	0.04	0.5	0.2	0.5
PCB 183	2,2',3,4,4',5',6-Heptachlorobiphenyl	0.7	5	0.09	0.5	0.3	0.5
PCB 184	2,2',3,4,4',6,6'-Heptachlorobiphenyl	0.6	5	0.05	0.5	0.1	0.5
PCB 187	2,2',3,4',5,5',6-Heptachlorobiphenyl	0.5	5	0.2	0.5	0.1	0.5
PCB 189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	0.7	5	0.09	0.5	0.1	0.5
PCB 194	2,2',3,3',4,4',5,5'-Octachlorobiphenyl	*	5	*	0.5	0.2	0.5
PCB 195	2,2',3,3',4,4',5,6-Octachlorobiphenyl	0.7	5	0.2	0.5	0.2	0.5
PCB 201	2,2',3,3',4,5',6'c-Octachlorobiphenyl	*	5	*	0.5	0.07	0.5
PCB 203	2,2',3,4,4',5,5',6-Octachlorobiphenyl	*	5	*	0.5	0.02	0.5
PCB 206	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	0.6	5	0.2	0.5	0.1	0.5
PCB 209	2,2',3,3',4,4',5,5',6,6'Decachlorobiphenyl	0.5	5	0.06	0.5	0.2	0.5

* Please contact Laboratory for latest limits

Columbia Analytical Services INC