



PCB Analysis by EPA Method 1668

Polychlorinated biphenyls (PCBs) are a group of man-made organic chemicals consisting of a hydrocarbon biphenyl structure with chlorine atoms attached. The number of chlorine atoms attached and the positions where they are attached leads to 209 possible configurations of individual PCB molecules or congeners. PCB congeners can be further characterized into homologous groups according to the degree of chlorination. There are 10 possible PCB homolog groups, organized by the number of chlorine atoms in the molecule. Because of their useful electrical insulation and chemical stability properties as well as their non-flammability, PCBs were used in a multitude of commercial and industrial products. Due to increasing concern about possible unintended impacts to human health and the environment, the manufacture of PCBs was banned domestically in 1979. PCBs, however, may be present in products produced before 1979.

There is a subset of PCB congeners, which due to their coplanar structure, are considered to have a higher potential for human health impacts. Of these coplanar PCB congeners, the World Health Organization (WHO) and the Center for Disease Control (CDC) has characterized 12 of these congeners as "dioxin like" based on a similarity with the structure of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD). WHO has calculated toxic equivalency factors (TEFs) for this list, similar to what is done with dioxins and furans.

Analytical Approach

Alpha Analytical offers PCB congener analysis by EPA Method 1668A for the reporting of all 209 PCB congeners and we also provide an analysis specific to the WHO dioxin-like congeners. Toxic equivalents (TEQs) are calculated and included in the report. In addition to these lists, Alpha can also provide an analysis for a custom list of PCB congeners of your choosing. Applicable sample matrices include aqueous, soil, sediment, and tissues. Please see the attached PCB target compound list included on the reverse. In general, congener reporting limits are in the <100 pg/L range for aqueous and the <10 pg/G range for soils or sediments.

Alpha Analytical utilizes Thermo high resolution mass spectrometer (HRMS) instrumentation equipped with dual Model 1310 gas chromatographs. This dual data acquisition configuration greatly increases analytical efficiencies and productivity. A number of different sample extraction and extract clean up protocols are available, depending on the sample media and project specific requirements.

Certifications

Alpha Analytical holds NELAP certification for PCB congener analysis by Method 1668A. Alpha also holds Department of Defense (DoD) certification and we are fully compliant with DoD/DoE QSM 5.3.

For more information about PCBs and the additional analytical options we can provide, please refer to our [website](#).

209 PCB Congeners

No.	Structure	No.	Structure	No.	Structure	No.	Structure	No.	Structure
1	2	43	2,2',3,5	85	2,2',3,,4,4'	127	3,3',4,5,5'	169	3,3',4,4',5,5'
2	3	44	2,2',3,5'	86	2,2',3,4,5	128	2,2',3,3',4,4'	170	2,2',3,3',4,4',5
3	4	45	2,2',3,6	87	2,2',3,4,5'	129	2,2',3,3',4,5	171	2,2',3,3',4,4',6
4	2,2'	46	2,2',3,6	88	2,2',3,4,6	130	2,2',3,3',4,5	172	2,2',3,3',4,5,5'
5	2,3	47	2,2',4,4'	89	2,2',3,4,6'	131	2,2',3,3',4,6	173	2,2',3,3',4,5,6
6	2,3'	48	2,2',4,5	90	2,2',3,4',5	132	2,2',3,3',4,6	174	2,2',3,3',4,5,6'
7	2,4	49	2,2',4,5'	91	2,2',3,4',6	133	2,2',3,3',5,5'	175	2,2',3,3',4,5',6
8	2,4'	50	2,2',4,6	92	2,2',3,5,5'	134	2,2',3,3',5,6	176	2,2',3,3',4,6,6'
9	2,5	51	2,2',4,6	93	2,2',3,5,6	135	2,2',3,3',5,6'	177	2,2',3,3',4',5,6
10	2,6	52	2,2',5,5'	94	2,2',3,5,6'	136	2,2',3,3',6,6'	178	2,2',3,3',5,5',6
11	3,3'	53	2,2',5,6'	95	2,2',3,5',6	137	2,2',3,4,4',5	179	2,2',3,3',5,6,6'
12	3,4	54	2,2',6,6'	96	2,2',3,6,6'	138	2,2',3,4,4',5'	180	2,2',3,4,4',5,5'
13	3,4'	55	2,3,3',4	97	2,2',3',4,5	139	2,2',3,4,4',6	181	2,2',3,4,4',5,6
14	3,5	56	2,3,3',4	98	2,2',3',4,6	140	2,2',3,4,4',6	182	2,2',3,4,4',5,6'
15	4,4'	57	2,3,3',5	99	2,2',4,4',5	141	2,2',3,4,5,5'	183	2,2',3,4,4',5',6
16	2,2',3	58	2,3,3',5'	100	2,2',4,4',6	142	2,2',3,4,5,6	184	2,2',3,4,4',6,6'
17	2,2',4	59	2,3,3',6	101	2,2',4,5,5'	143	2,2',3,4,5,6'	185	2,2',3,4,5,5',6
18	2,2',5	60	2,3,4,4'	102	2,2',4,5,6'	144	2,2',3,4,5',6	186	2,2',3,4,5,6,6'
19	2,2',6	61	2,3,4,5	103	2,2',4,5',6	145	2,2',3,4,6,6'	187	2,2',3,4',5,5',6
20	2,3,3'	62	2,3,4,6	104	2,2',4,6,6'	146	2,2',3,4',5,5'	188	2,2',3,4',5,6,6'
21	2,3,4	63	2,3,4',5	105	2,3,3',4,4'	147	2,2',3,4,5,6	189	2,3,3',4,4',5,5'
22	2,3,4'	64	2,3,4',6	106	2,3,3',4,5	148	2,2',3,4',5,6'	190	2,3,3',4,4',5,6
23	2,3,5	65	2,3,5,6	107	2,3,3',4',5	149	2,2',3,4',5',6	191	2,3,3',4,4',5',6
24	2,3,6	66	2,3',4,4'	108	2,3,3',4,5'	150	2,2',3,4',6,6'	192	2,3,3',4,5,5',6
25	2,3',4	67	2,3',4,5	109	2,3,3',4,6	151	2,2',3,5,5',6	193	2,3,3',4',5,5',6
26	2,3',5	68	2,3',4,5'	110	2,3,3',4',6	152	2,2',3,5,6,6'	194	2,2',3,3',4,4',5,5'
27	2,3',6	69	2,3',4,6	111	2,3,3',5,5'	153	2,2',4,4',5,5'	195	2,2',3,3',4,4',5,6
28	2,4,4'	70	2,3',4',5	112	2,3,3',5,6	154	2,2',4,4',5,6'	196	2,2',3,3',4,4',5,6'
29	2,4,5	71	2,3',4',6	113	2,3,3',5',6	155	2,2',4,4',6,6'	197	2,2',3,3',4,4',6,6'
30	2,4,6	72	2,3',5,5'	114	2,3,4,4',5	156	2,3,3',4,4',5	198	2,2',3,3',4,5,5',6
31	2,4',5	73	2,3',5',6	115	2,3,4,4',6	157	2,3,3',4,4',5'	199	2,2',3,3',4,5,6,6'
32	2,4',6	74	2,4,4',5	116	2,3,4,5,6	158	2,3,3',4,4',6	200	2,2',3,3',4,5',6,6'
33	2',3,4	75	2,4,4',6	117	2,3,4',5,6	159	2,3,3',4,5,5'	201	2,2',3,3',4',5,5',6
34	2,3,5	76	2',3,4,5	118	2,3',4,4',5	160	2,3,3',4,5,6	202	2,2',3,3',5,5',6,6'
35	3,3',4	77	3,3',4,4'	119	2,3',4,4',6	161	2,3,3',4,5',6	203	2,2',3,4,4',5,5',6
36	3,3',5	78	3,3',4,5	120	2,3',4,5,5'	162	2,3,3',4',5,5'	204	2,2',3,4,4',5,6,6'
37	3,4,4'	79	3,3',4,5'	121	2,3',4,5',6	163	2,3,3',4',5,6	205	2,3,3',4,4',5,5',6
38	3,4',5	80	3,3',5,5'	122	2',3,3',4,5	164	2,3,3',4',5',6	206	2,2',3,3',4,4',5,5',6
39	3,4'5	81	3,4,4',5	123	2',3,4,4',5	165	2,3,3',5,5',6	207	2,2',3,3',4,4',5,6,6'
40	2,2',3,3'	82	2,2',3,3',4	124	2',3,4,5,5'	166	2,3,4,4',5,6	208	2,2',3,3',4,5,5',6,6'
41	2,2',3,4	83	2,2',3,3',5	125	2',3,4,5,6'	167	2,3',4,4',5,5'	209	2,2',3,3',4,4',5,5',6,6'
42	2,2',3,4	84	2,2',3,3',6	126	3,3',4,4',5	168	2,3',4,4',5',6		

Note: WHO list dioxin-like PCB Congeners in bold

How to Reach Us

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