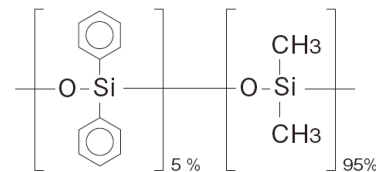


Analytical and Retention Index for Pesticide Residues in Foods - Using InertCap5 MS/NP

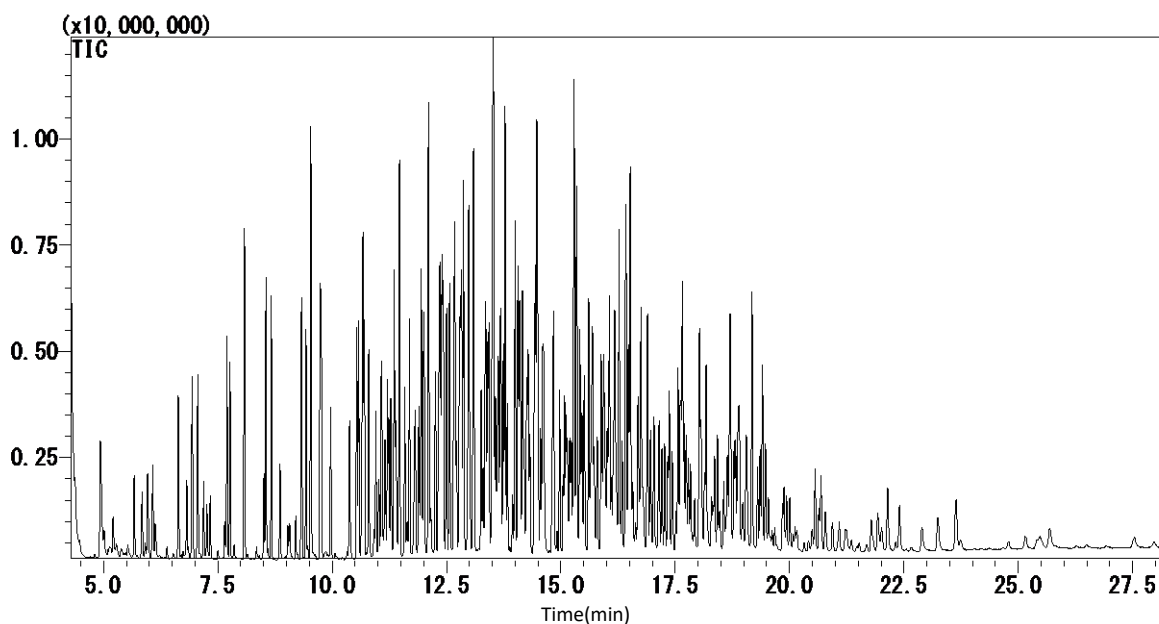
A GC-capillary column InertCap 5 MS and NP to determine the retention time and retention index of pesticide residues in foods.

InertCap 5 MS and NPs are micropolar columns chemically bonded to 5% phenyl-95% methyl polysiloxane. The reagents used were PL2005 agrochemicals GC/MS Mix I, II, III, IV, V, VI, and VII of Hayashi Pure Chemical Ind., Ltd., and the Model GCMS-QP2010 Plus of SHIMADZU CORPORATION was used for the measurement. The first and second pages show the TICC (Total Ion Current Chromatogram) of PL2005 pesticide GC/MS Mix I-VII blended components, and the third and ninth pages show the TICC, retention time, and retention index of each group of PL2005 pesticide GC/MS Mix I-VII.



Structural formula of InertCap 5 MS/NP liquid phase.

Equivalent: HP-5ms, Rtx-5MS, Rxi-5MS, Equity-5, SPB-5



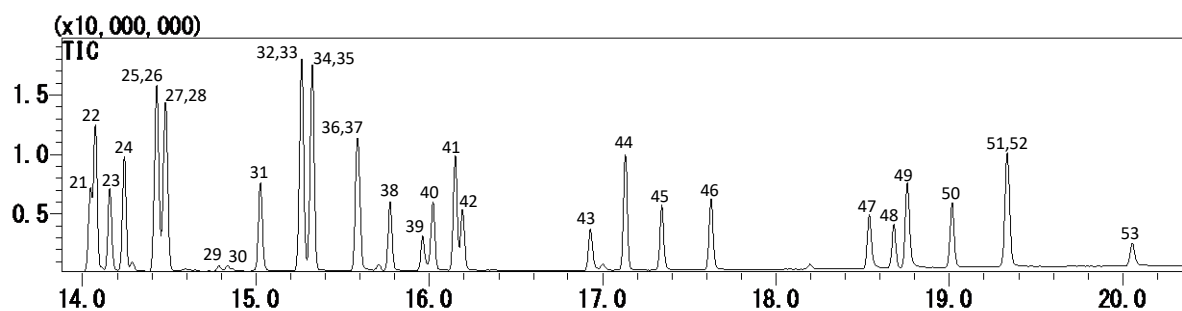
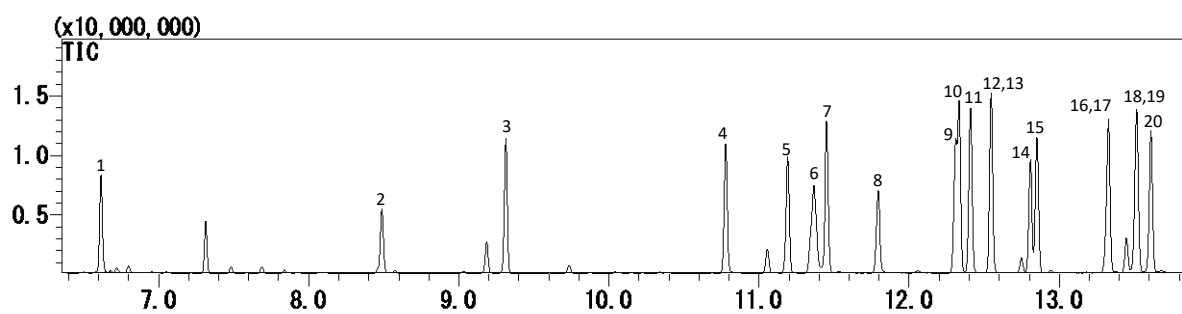
Conditions

System	: GC - MS
Column	: InertCap 5MS/NP 0.25 mm I.D. x 30 m, df = 0.25 μ m (Cat. No. 1010-18642)
Col. Temp.	: 50 °C (1 min hold) - 25 °C/min - 125 °C - 10 °C/min - 280 °C
Carrier Gas	: He 40 cm/sec (constant linear velocity)
Injection	: Splitless 1 min 250 °C
Liner	: Splitless liners (Cat. No. 3001-16329,5 bottles)
Interface Temp.	: 280 °C
Detection	: MS Scan (m/z : 45 - 450)
Ion source	: 230 °C
Inj. Vol.	: 1 μ L
Sample	: PL2005 pesticide GC/MS Mix I - VII 2 ppm

* Group names of the reagents containing each compound PL2005 the X part of the pesticide GC/ MS Mix X

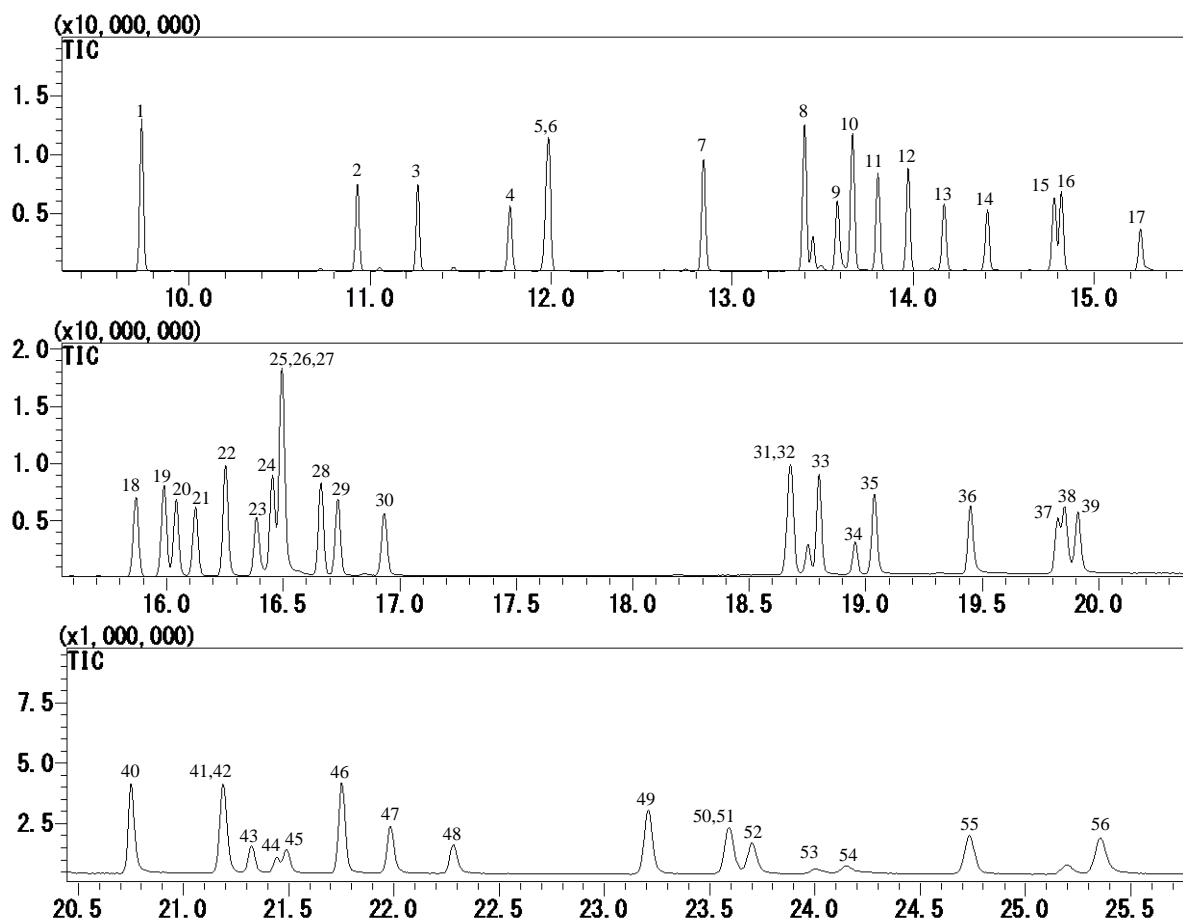
Compound name	Retention index	*	Compound name	Retention index	*	Compound name	Retention index	*	Compound name	Retention index	*
DCIP	1057	IV	Diclofenthion	1888	I	Disulfotone sulfone	2146	VII	Acetamidiprid	2475	VII
Clofentidine digest	1181	V	Metribuzin	1890	V	Butachlor	2156	IV	Bromconazole-1	2480	V
Tachigaren	1193	VI	Oxospoconazole formyl decomposition product	1892	VI	Endosulfan	2157	II	Fenoxycarb	2482	IV
Naphthalene-d8	1198	I,S	Dimethenamide (Dimethenamide P)	1893	IV	Dithalimphos	2161	VI	Phosmet	2484	III
Dichlorvos	1251	I	Bromobutide	1896	II	Imazametabenzmethyl	2163	VII	Tetramethrin-2	2489	V
Neristoxin	1283	VI	Acetochlor	1903	IV	Flutriahole	2164	VII	Bromopropylate	2490	II
Allyldoctor	1295	IV	Terbucarb	1904	VI	TCMTB	2166	VII	EPN	2491	I
Dichlobenil	1357	III	Vinclozolin	1906	III	Fenamiphos	2167	I	Bifenthrin	2491	II
EPTC	1364	VI	Spiroxamine-1	1906	VII	Chlorfensone	2170	II	Chrysene-d12	2492	I,S
Diphenyl	1394	V	Parathion methyl	1906	I	Butamifos	2173	I	Bifenazate	2493	V
Mevinphos	1433	I	Chlorpyrifos-methyl	1907	I	Napropamide	2176	IV	Picolinaphene	2493	VII
Butyrate	1438	VI	Simetryn	1911	V	Flutolanil	2176	II	Piperophos	2501	I
Chlormefos	1449	VI	Cimeconazole	1914	II	Hexaconazole	2180	V	Methoxychlor	2504	VII
Etridiazole	1466	III	Tolclofosmethyl	1917	I	Isoprothiolane	2185	II	Fenpropathrin	2506	II
Acenaphthene-d10	1499	I,S	Ametryn	1921	V	Prothiohost	2188	I	Etoazole	2512	IV
Clothianidin	1501	VI	Alachlor	1923	II	(E)-metminostrobin.	2189	IV	Tebufenpyrad	2515	IV
Thiocyclam	1509	V	Prometryn	1928	IV	Fludioxonil	2189	V	Phenamidon	2518	VII
Methacryfos	1510	I	Metalaxil (Mephenoxam)	1932	IV	Profenofos	2192	I	Bifenox	2527	II
Chloroneb	1519	VII	Cinmethylin	1932	VI	Tricyclazole	2195	VII	Indanofan	2528	VI
Crimidine	1528	VI	Phenclorfos	1937	II	Pretilachlor	2199	IV	Anilophos	2534	I
Orthophenylphenol	1528	VI	2-(1-naphthyl)acetamide	1949	VII	Tribufos	2199	II	Bromconazole-2	2537	V
Isoprocarb	1547	VII	Dithiopyr	1954	II	Uniconazole (Uniconazole P)	2200	III	Clomeprop	2537	II
Molinate	1548	II	Terbutryn	1955	IV	Oxadiazon	2207	III	Phenothrin-1	2541	VI
XMC	1568	VII	Spiroxamine-2	1961	VII	Myclobutanil	2215	II	Etoazole metabolite	2541	IV
OMETHATE	1600	III	Fenitrothion	1961	I	Carboxin	2216	VII	Iprodione metabolite	2550	V
Xylyl carb	1606	VI	Bromacil	1963	V	Imibenconazole debenzyl	2216	VII	Tetradifon	2553	III
Tecnazene	1620	III	Pirimiphos-methyl	1964	I	Oxyfluorfen	2217	III	Phenothrin-2	2553	VI
Propoxur	1620	VII	Etofosate	1966	VII	Frampropmethyl	2217	VII	Furametpyr	2553	V
Propanol	1624	IV	Esprocarb	1971	IV	Flusilazole	2222	IV	Pentoxazone	2569	V
Demeton-S-methyl (methyldemeton)	1630	III	(E)-Dimethylvinphos	1973	I	Buprofezin	2223	II	Phosalone	2575	I
Diphenylamine	1633	IV	Quinoclamine	1975	II	Bupirimate	2226	III	Azinphosmethyl	2576	I
Chlorethoxyfos	1635	VII	Dichlofluaniid	1980	V	Kresoxim	2227	II	Pyriproxyfen	2582	V
Ethoprophos	1644	I	Malathion	1981	I	Azaconazole	2228	II	Leptophos	2583	VI
Fenmedifam decomposition product	1645	VI	Thiobencarb	1984	III	Diclobutrazole	2228	II	Cyhalofop	2591	II
Chlorpropham	1658	II	Diethofencarb	1988	IV	Thifluzamide	2228	III	Cyhalothrin-1	2592	III
Diclofluamide metabolite	1665	V	Metolachlor (S-metolachlor)	1998	IV	(Z)-metminostrobin	2234	VII	Mefenacet	2600	V
Etafurarin	1669	III	Cyanazine	1999	II	Isoxathione	2241	III	Amitraz	2606	VI
Naled	1670	III	Fenthion	2000	I	Ciflufenamide	2247	II	Furametopyr metabolite	2610	V
Flucirazole metabolite	1671	IV	(Z)-dimethylvinphos	2001	I	Nitrofen	2248	V	Cyhalothrin-2	2617	III
Diclotophos	1677	III	Fenpropimorph	2004	VI	Cyproconazole	2251	IV	Acrinathrin	2638	II
2,6-Dichlorobenzamide	1678	VI	Carbetamide	2005	VI	1,1-Dichloro-2,2-bis(4-ethylphenyl)ethane	2255	VII	Fenarimol	2642	II
Dioxabenzophos (salithione)	1682	I	Chlorpyrifos	2006	I	Chlorphenapil	2255	II	Pyrazofos	2649	II
Trifluralin	1685	III	Parathion	2007	I	Fenoxanil	2260	IV	Azimphoethyl	2658	VI
Monocrotophos	1686	III	Triadimefon	2012	III	Chlorthiophos-2	2263	VI	Pyraclophos	2666	I
Venfluralin	1689	II	Chlorthal-dimethyl	2017	III	Flufenpyrethylethyl	2271	VII	Dialyphos	2672	VI
Sulfotepp	1696	VI	Isophenphosoxone	2017	VII	Chlorbenzylate	2271	IV	Phenoxaprop ethyl (phenoxaprop P ethyl)	2677	V
Cassafos	1699	I	Isocarbophos	2018	III	Chloropropylate	2272	V	Oryzalin	2698	VII
Diarate-1	1706	VII	Nitrotar isopropyl	2020	III	Fensulfotioin	2278	I	Bitertanol-1	2707	V
Phorate	1707	I	Tetraconazole	2020	IV	Endosulfan	2279	II	Permethrin-1	2716	III
α-BHC	1718	V	Fthalide	2039	II	Chlorthiophos-3	2281	VI	Bitertanol-2	2720	V
Desmedipham decomposition product	1721	IV	Phosphatase-1	2039	I	Diniconazole	2287	VI	Spirodiclofen	2723	VI
Diarate-2	1723	VII	Thiamethoxam decomposition product	2040	VI	(Z)-pyriminobackmethyl	2288	III	Oxospoconazole	2723	VI
Thiometon	1727	III	Diphenamid	2042	IV	Oxadixyl	2299	V	Permethrin-2	2732	III
Dicloran	1738	II	Bromophos	2043	II	Ethion	2301	I	Pyridaben	2736	III
Dimethoate	1739	I	Phosphatase-2	2044	I	Chlorthiophos-1	2308	VI	Fluquinconazole	2746	II
Simazine	1748	IV	Cyprodinil	2057	IV	Mepronil	2316	IV	Dioxathion	2760	VI
Carbofuran	1751	VII	(E)-Chlorphenvinphos	2064	I	Fluacriplim	2323	III	Butafenacil	2764	IV
Furirazole	1752	VII	Dimethamethrin	2068	IV	Triazophos	2326	I	Ethobenzanide	2779	IV
Chlorbufam	1753	VII	Ethychozate	2071	VI	Sulprofos	2328	III	Caffenstrol	2793	II
Swep	1756	V	Pendimethalin	2072	III	Isxadiphenethyl	2336	VII	Cyfluthrin-1	2795	II
Dimetipine	1756	II	Penconazole	2074	III	Azamestifos	2337	VI	Fenbuconazole	2798	V
Atrazine	1758	II	Clozolate	2080	VII	Chlornitrophenone	2345	V	Cyfluthrin-2	2807	II
Chromazone	1767	VII	Zoxamide decomposition product	2080	VII	Carbophenothion	2350	III	Cyfluthrin-3	2818	II
Propazine	1767	VII	(Z)-pyriphenox	2080	III	Carfentrasono ethyl	2351	IV	Cyfluthrin-4	2822	II
β-BHC	1767	V	Thiabendazole	2081	VII	Benaraxyl	2356	IV	Cypermethrin-1	2837	III
Trifluranide metabolite	1772	V	Allethrin-1	2081	III	Cyanofenphos	2358	III	Halfenprox	2847	II
Dioxathion decomposition product	1781	VI	Allethrin-2	2083	III	Edifenphos	2360	I	Cypermethrin-2	2850	III
γ-BHC (lindane)	1782	V	Tolyfluranide	2084	V	Quinoxiphenone	2362	III	Xalofop Ethyl (Kizalofop P Ethyl)	2860	VI
Cyanophos	1788	II	Allethrin-3 (vioallethrin)	2088	III	Norflurazon	2362	VII	Cypermethrin-3	2862	III
Terbufos	1791	I	(Z)-chlorfenvinphos	2089	I	Propiconazole-1	2364	IV	Cypermethrin-4	2866	III
Quintozene	1792	III	Fipronil	2089	II	Lenacil	2365	VI	Flucitrinate-1	2868	II
Propyzamide	1794	III	Allethrin-4 (vioallethrin)	2090	III	Trifloxystrobin	2367	III	Etofenprox	2880	IV
Pyrochlorone	1796	V	Isofenphos	2090	I	Endosulfan sulfate	2373	VII	Benzo(a)pyrene -d12	2892	I,S
Fonofos	1798	I	Mecarbam	2090	III	Chloridazon	2373	V	Flucitrinate-2	2896	II
Pyrimethanil	1805	VI	Captan	2091	V	Pyraflufen ethyl	2377	VI	Silafluofen	2903	V
Anthracene-d10	1809	I,S	Diclocimet-1	2094	V	Propiconazole-2	2379	IV	Fluridone	2924	VII
Diazinon	1811	I	Quinalphos	2096	I	(E)-pyriminobackmethyl	2383	III	Pyrimidiphene	2941	III
Phosphamide-1	1813	I	Fentoate	2097	I	Hexazinone	2394	VII	Flumioxazine	2967	IV
Prohydrojasmon-1	1821	VI	Triadimenol-1	2097	III	Tebuconazole	2406	IV	Fenvalerate-1	2968	II
Disulfoton	1823	III	Dimepiperate	2097	IV	Diclofop-methyl	2408	VII	Pilacrostrobin	2973	VI
Terbacil	1824	IV	Methoprene	2104	V	Tenyl chloride	2408	IV	Fluvalinate-1	2998	II
δ-BHC	1825	V	Folpet	2105	V	Diflufenican	2411	III	Fenvalerate-2 (esfenvalerate)	2998	II,VI
Tefluthrin	1832	III	Ferrimzone	2107	VI	Propargitt 1	2412	V	Fluvalinate-2	3005	II
Thioethyl MCPA	1835	V	Procyimidone	2109	III	Resmethrin-1	2414	VII	Diphenconazole-1	3024	II
Chlorothalonil	1837	V	Triadimenol-2	2111	III	Propargit 2	2414	V	Diphenconazole-2	3034	II
Isazophos	1837	I	Chlorbenside	2115	VII	Piperonyl butoxide	2421	V	Pyrazoxyphene	3045	V
Tri-allate	1840	II	Pronafos	2124	I	Cantafol	2424	V	Indoxacarb	3063	IV

PL2005 pesticide GC/ MS Mix I



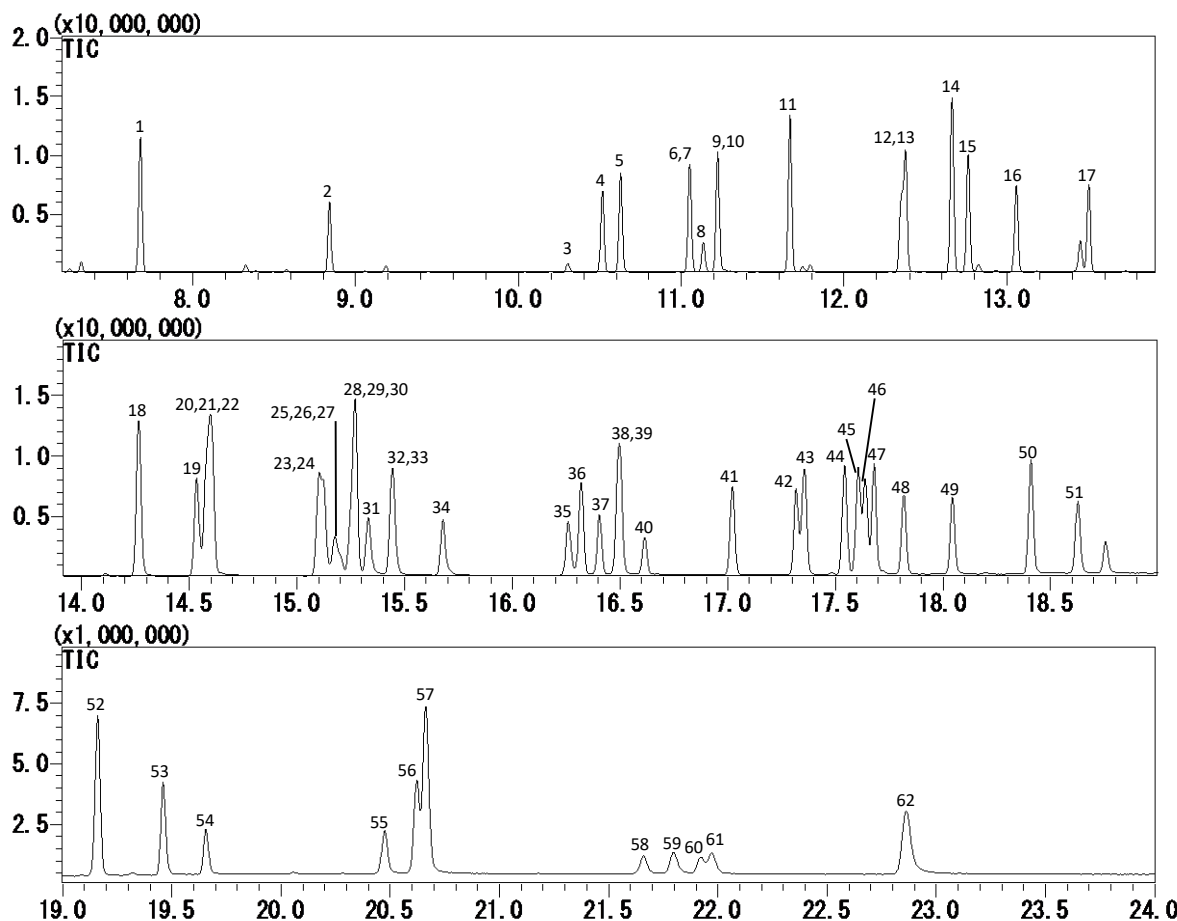
Peak No.	Compound	Retention time (min)	Retention index	Peak No.	Compound	Retention time (min)	Retention index
1	Dichlorvos	6.634	1251	28	Parathion	14.507	2007
2	Mevinphos	8.505	1433	29	Phosphatase-1	14.806	2039
3	Methacryfos	9.331	1510	30	Phosphatase-2	14.855	2044
4	Ethoprophos	10.796	1644	31	(E)-Chlorphenvinphos	15.043	2064
5	Dioxabenzophos (salithione)	11.209	1682	32	(Z)-chlorfenvinphos	15.274	2089
6	Cassafos	11.386	1699	33	Isofenphos	15.287	2090
7	Phorate	11.468	1707	34	Quinalphos	15.341	2096
8	Dimethoate	11.812	1739	35	Fentoate	15.347	2097
9	Cyanophos	12.328	1788	36	Propafos	15.599	2124
10	Terbufos	12.352	1791	37	Methidathion	15.612	2126
11	Fonofos	12.428	1798	38	Tetrachlorvinphos	15.792	2146
12	Diazinon	12.563	1811	39	Fenamiphos	15.980	2167
13	Phosphamide-1	12.586	1813	40	Butamifos	16.039	2173
14	Isazophos	12.825	1837	41	Prothiohost	16.169	2188
15	Etrimphos	12.869	1841	42	Profenofos	16.210	2192
16	Phosphamide-2	13.328	1886	43	Fensulfothion	16.951	2278
17	Diclofenthion	13.347	1888	44	Ethion	17.150	2301
18	Parathion methyl	13.527	1906	45	Triazophos	17.360	2326
19	Chlorpyrifos-methyl	13.536	1907	46	Edifenphos	17.645	2360
20	Tolclofosmethyl	13.630	1917	47	Pyridaphenthion	18.556	2473
21	Fenitrothion	14.062	1961	48	EPN	18.701	2491
22	Pirimiphos-methyl	14.092	1964	49	Piperophos	18.779	2501
23	(E)-Dimethylvinphos	14.176	1973	50	Anilophos	19.035	2534
24	Malathion	14.259	1981	51	Phosalone	19.350	2575
25	Fenthion	14.443	2000	52	Azinphosmethyl	19.360	2576
26	(Z)-dimethylvinphos	14.453	2001	53	Pyraclphos	20.076	2666
27	Chlorpyrifos	14.494	2006				

PL2005 pesticide GC/MS Mix II



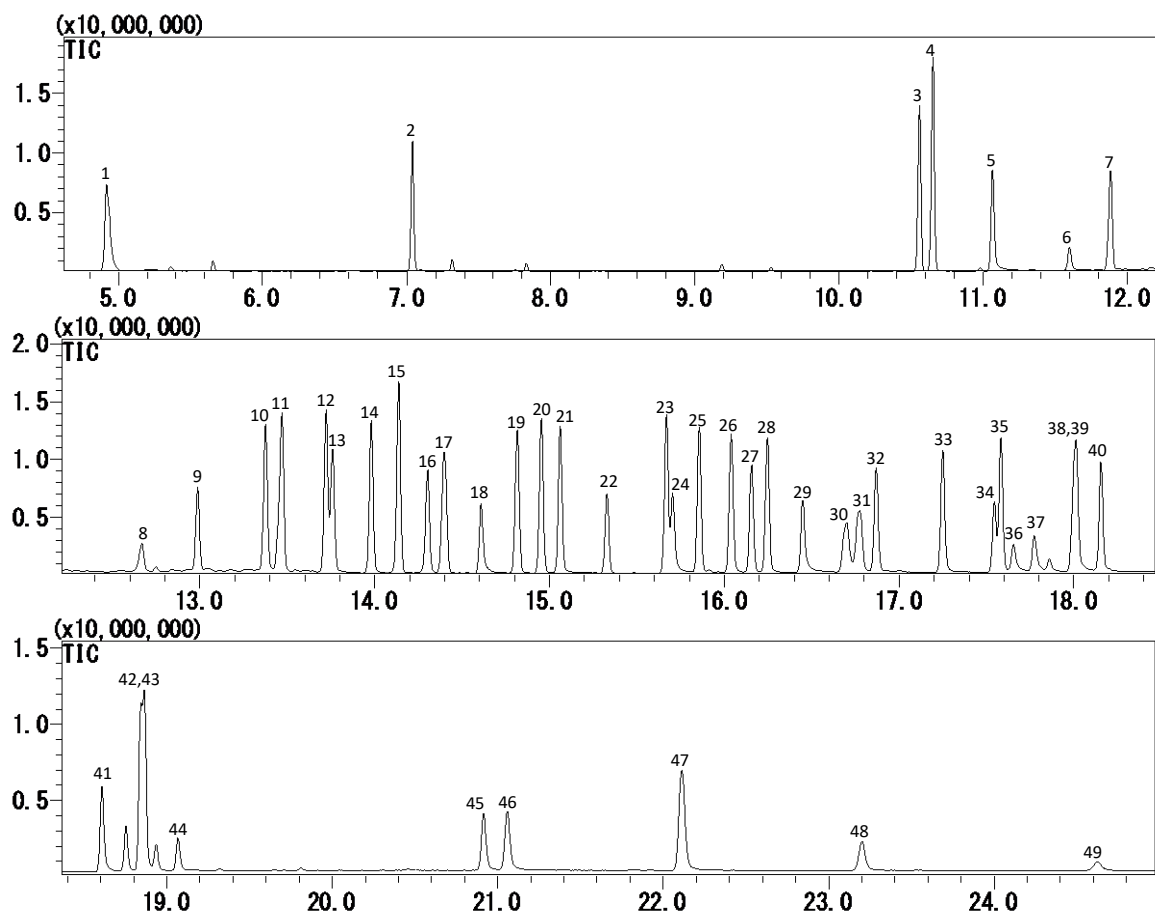
Peak No.	Component	Retention time (min)	Retention index	Peak No.	Component	Retention time (min)	Retention index
1	Molinatate	9.756	1548	29	Chlorphenapil	16.757	2255
2	Chlorpropham	10.950	1658	30	Endosulfan	16.959	2279
3	Venfluralin	11.284	1689	31	Bromopropylate	18.688	2490
4	Dicloran	11.794	1738	32	Bifenthrin	18.702	2491
5	Dimetipine	11.993	1756	33	Fenpropathrin	18.821	2506
6	Atrazine	12.009	1758	34	Bifenox	18.977	2527
7	Tri-allate	12.862	1840	35	Clomeprop	19.058	2537
8	Bromobutide	13.423	1896	36	Cyhalofop	19.469	2591
9	Cimeconazole	13.603	1914	37	Acrinathrin	19.846	2638
10	Alachlor	13.689	1923	38	Fenarimol	19.879	2642
11	Phenclorfos	13.827	1937	39	Pyrazofos	19.934	2649
12	Dithiopyr	13.995	1954	40	Fluquinconazole	20.778	2746
13	Quinoclamine	14.194	1975	41	Caffestrol	21.215	2793
14	Cyanazine	14.434	1999	42	Cyfluthrin-1	21.235	2795
15	Fthalide	14.804	2039	43	Cyfluthrin-2	21.351	2807
16	Bromophos	14.842	2043	44	Cyfluthrin-3	21.474	2818
17	Fipronil	15.278	2089	45	Cyfluthrin-4	21.520	2822
18	Endosulfan	15.892	2157	46	Halfenprox	21.785	2847
19	Chlorfenson	16.012	2170	47	Flucitriate-1	22.014	2868
20	Flutolanil	16.063	2176	48	Flucitriate-2	22.319	2896
21	Isoprothiolane	16.145	2185	49	Fenvalerate-1	23.245	2968
22	Tribufos	16.273	2199	50	Fluvalinate-1	23.631	2998
23	Myclobutanil	16.407	2215	51	Fenvalerate-2 (esfenvalerate)	23.636	2998
24	Buprofezin	16.476	2223	52	Fluvalinate-2	23.743	3005
25	Kresoxim	16.514	2227	53	Diphenconazole-1	24.046	3024
26	Azaconazole	16.519	2228	54	Diphenconazole-2	24.190	3034
27	Diclobutrazole	16.521	2228	55	Deltamethrin (a tralomethrin decomposition product)	24.780	3071
28	Ciflufenamide	16.685	2247	56	Azoxystrobin	25.403	3109

PL2005 pesticide GC/ MS Mix III



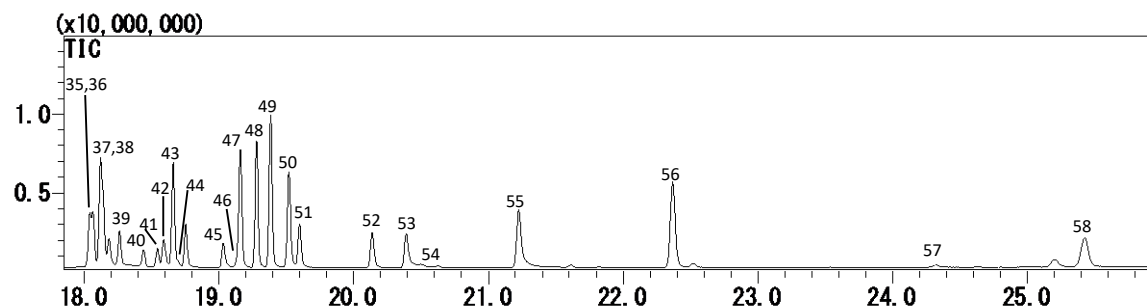
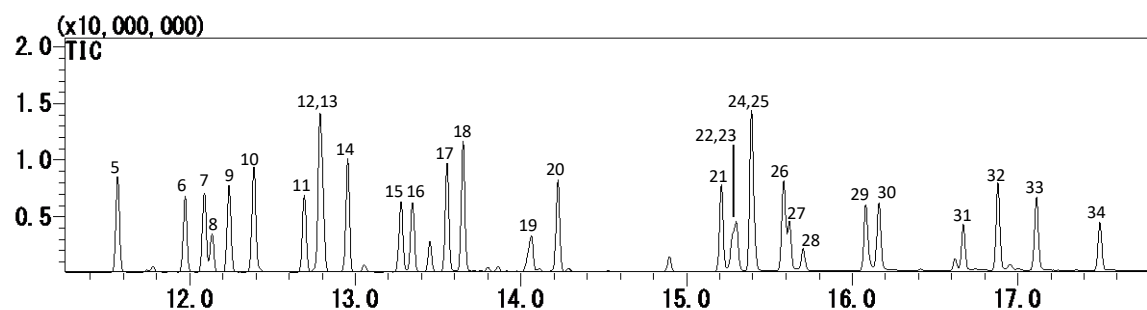
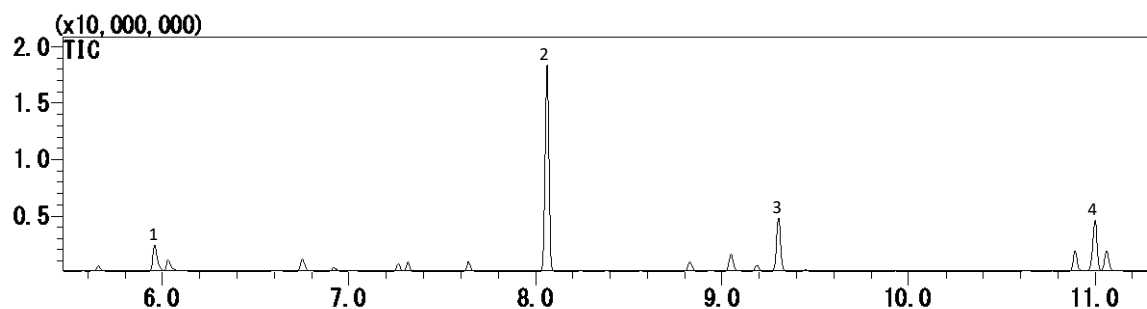
Peak No.	Compound	Retention time (min)	Retention index	Peak No.	Compound	Retention time (min)	Retention index
1	Dichlobenil	7.698	1357	32	Procymidone	15.461	2109
2	Etridiazole	8.860	1466	33	Triadimenol-2	15.476	2111
3	OMETHATE	10.320	1600	34	(E)-Pyriphenox	15.693	2135
4	Tecnazene	10.534	1620	35	Uniconazole (Uniconazole P)	16.277	2200
5	Demeton-S-methyl (methyldemeton)	10.645	1630	36	Oxadiazon	16.338	2207
6	Etalfurarin	11.068	1669	37	Oxyfluorfen	16.424	2217
7	Naled	11.077	1670	38	Bupirimate	16.507	2226
8	Dicrotophos	11.152	1677	39	Thifluzamide	16.521	2228
9	Trifluralin	11.240	1685	40	Isoxathione	16.634	2241
10	Monocrotophos	11.250	1686	41	(Z)-pyriminobackmethyl	17.041	2288
11	Thiometon	11.686	1727	42	Fluacripilim	17.337	2323
12	Quintozene	12.368	1792	43	Sulprofos	17.373	2328
13	Propyzamide	12.394	1794	44	Carbophenothion	17.561	2350
14	Disulfoton	12.680	1823	45	Cyanofenphos	17.625	2358
15	Tefluthrin	12.778	1832	46	Quinoxyphe	17.660	2362
16	Formothion	13.074	1861	47	Trifloxystrobin	17.699	2367
17	Vinclozolin	13.519	1906	48	(E)-pyriminobackmethyl	17.836	2383
18	Thiobencarb	14.281	1984	49	Diflufenican	18.061	2411
19	Triadimefon	14.552	2012	50	Pyributicarb	18.427	2457
20	Chlorthal-dimethyl	14.597	2017	51	Phosmet	18.646	2484
21	Isocarbophos	14.615	2018	52	Tetradifon	19.179	2553
22	Nitrotar isopropyl	14.626	2020	53	Cyhalothrin-1	19.478	2592
23	Pendimethalin	15.119	2072	54	Cyhalothrin-2	19.675	2617
24	Penconazole	15.140	2074	55	Permethrin-1	20.496	2716
25	(Z)-pyriphenox	15.191	2080	56	Permethrin-2	20.645	2732
26	Allethrin-1	15.202	2081	57	Pyridaben	20.688	2736
27	Allethrin-2	15.218	2083	58	Cypermethrin-1	21.684	2837
28	Allethrin-3 (vioallethrin)	15.270	2088	59	Cypermethrin-2	21.824	2850
29	Allethrin-4 (vioallethrin)	15.286	2090	60	Cypermethrin-3	21.951	2862
30	Mecarbam	15.289	2090	61	Cypermethrin-4	21.997	2866
31	Triadimenol-1	15.349	2097	62	Pyrimidiphe	22.894	2941

PL2005 pesticide GC/MS Mix IV



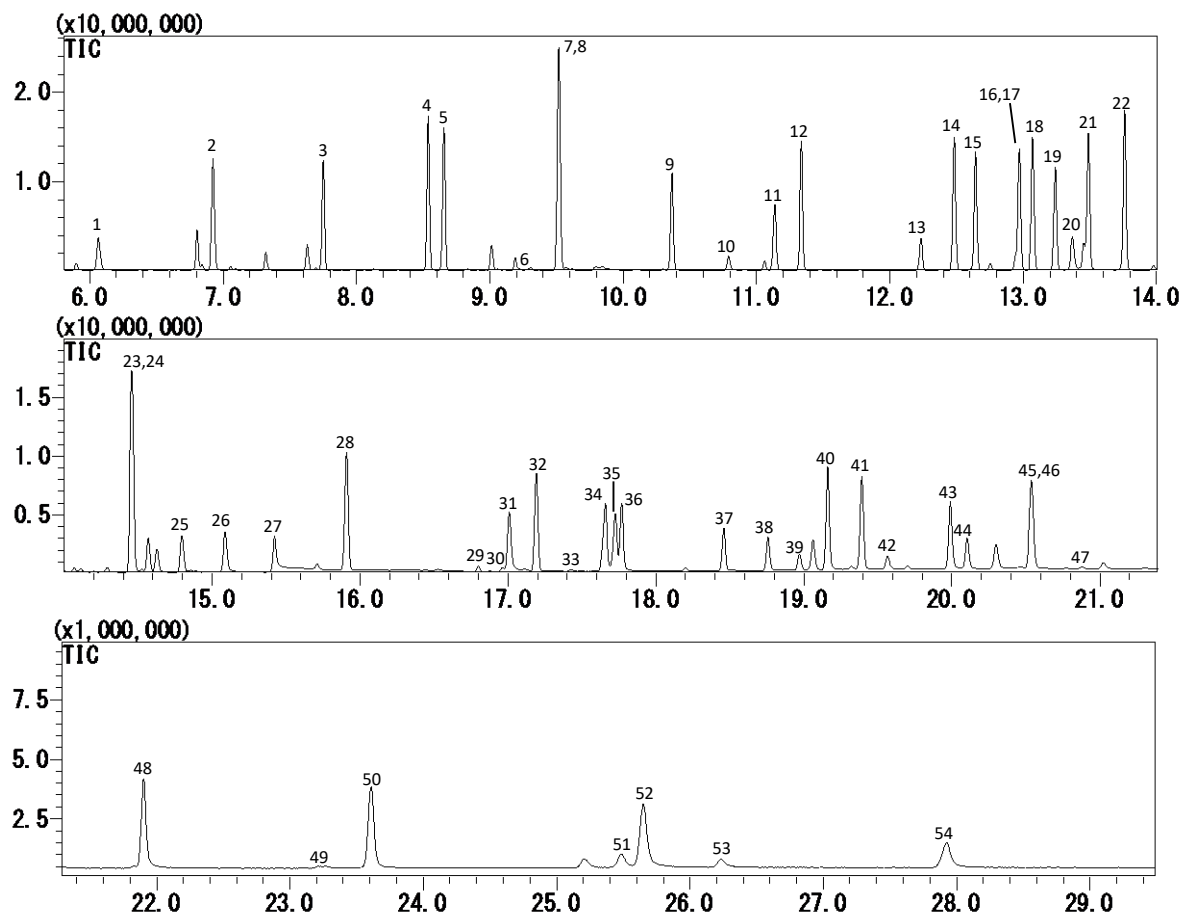
Peak No.	Component	Retention time (min)	Retention index	Peak No.	Component	Retention time (min)	Retention index
1	DCIP	4.935	1057	26	Napropamide	16.061	2176
2	Allydoclor	7.060	1295	27	(E)-metminostrobin.	16.178	2189
3	Propanol	10.577	1624	28	Pretilachlor	16.268	2199
4	Diphenylamine	10.673	1633	29	Flusilazole	16.468	2222
5	Flucirazole metabolite	11.086	1671	30	Cyproconazole	16.720	2251
6	Desmedipham decomposition product	11.619	1721	31	Fenoxanil	16.793	2260
7	Simazine	11.904	1748	32	Chlorbenzylate	16.892	2271
8	Terbacil	12.697	1824	33	Mepronil	17.272	2316
9	Iprobenfos	13.007	1855	34	Carfentrasone ethyl	17.567	2351
10	Dimethenamide (Dimethenamide P)	13.396	1893	35	Benaraxyl	17.607	2356
11	Acetochlor	13.490	1903	36	Propiconazole-1	17.675	2364
12	Prometryn	13.742	1928	37	Propiconazole-2	17.796	2379
13	Metalaxil (Mephenoxam)	13.777	1932	38	Tebuconazole	18.018	2406
14	Terbutryn	14.002	1955	39	Tenyl chloride	18.037	2408
15	Esprocarb	14.157	1971	40	Resmethrin-2 (bioresmethrin)	18.179	2426
16	Diethofencarb	14.323	1988	41	Fenoxycarb	18.631	2482
17	Metolachlor (S-metolachlor)	14.419	1998	42	Etoxazole	18.865	2512
18	Tetraconazole	14.627	2020	43	Tebufenpyrad	18.886	2515
19	Diphenamid	14.835	2042	44	Etoxazole metabolite	19.089	2541
20	Cyprodinil	14.974	2057	45	Butafenacil	20.944	2764
21	Dimethamethrin	15.081	2068	46	Ethobenzanide	21.088	2779
22	Dimepiperate	15.350	2097	47	Etofenprox	22.149	2880
23	Fenothiocarb	15.692	2135	48	Flumioxazine	23.238	2967
24	Paclobutrazol	15.723	2138	49	Indoxacarb	24.662	3063
25	Butachlor	15.878	2156				

PL2005 pesticide GC/ MS Mix V



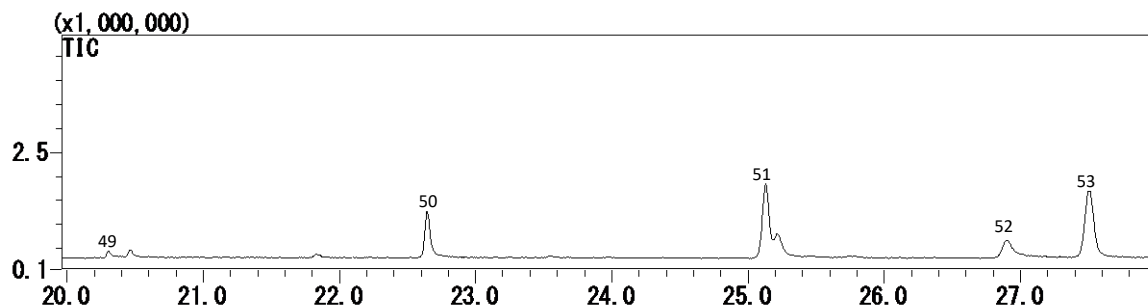
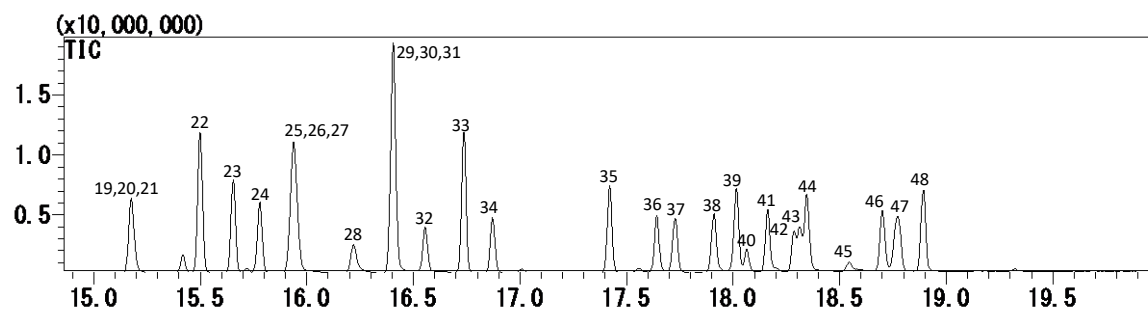
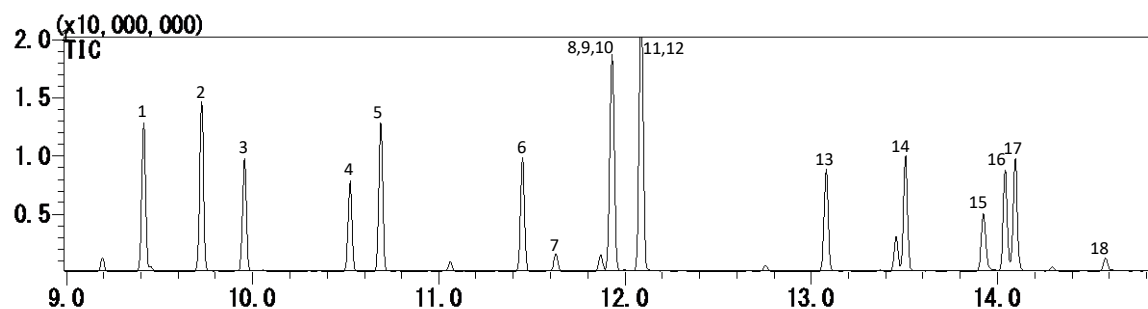
Peak No.	Compound	Retention time (min)	Retention index	Peak No.	Compound	Retention time (min)	Retention index
1	Clofentedine digest	5.975	1181	30	Fludioxonil	16.182	2189
2	Diphenyl	8.081	1394	31	Nitrofen	16.692	2248
3	Thiocyclam	9.323	1509	32	Chloropropylate	16.902	2272
4	Diclofluanide metabolite	11.017	1665	33	Oxadixyl	17.131	2299
5	α -BHC	11.586	1718	34	Chlornitrophenene	17.518	2345
6	Sweep	11.992	1756	35	Propargitt 1	18.065	2412
7	β -BHC	12.108	1767	36	Propargitt 2	18.086	2414
8	Trifluranide metabolite	12.154	1772	37	Piperonyl butoxide	18.142	2421
9	γ -BHC (lindane)	12.258	1782	38	Captafol	18.166	2424
10	Pyrochlorone	12.407	1796	39	Nitralin	18.285	2439
11	δ -BHC	12.710	1825	40	Iprodione	18.463	2461
12	Thioethyl MCPA	12.802	1835	41	Tetramethrin-1	18.567	2474
13	Chlorothalonil	12.822	1837	42	Bromconazole-1	18.613	2480
14	Oxabetrinyl	12.973	1851	43	Tetramethrin-2	18.682	2489
15	Propanil	13.295	1883	44	Bifenazate	18.716	2493
16	Metribuzin	13.364	1890	45	Bromconazole-2	19.054	2537
17	Simetryn	13.574	1911	46	Iprodione metabolite	19.153	2550
18	Ametryn	13.670	1921	47	Furametopyr	19.181	2553
19	Bromacil	14.079	1963	48	Pentoxazone	19.302	2569
20	Dichlofluanid	14.244	1980	49	Pyriproxyfen	19.405	2582
21	Tolyfuranide	15.229	2084	50	Mefenacet	19.541	2600
22	Captan	15.299	2091	51	Furametopyr metabolite	19.624	2610
23	Diclocimet-1	15.321	2094	52	Phenoxaprop ethyl (phenoxaprop P ethyl)	20.161	2677
24	Methoprene	15.411	2104	53	Bitertanol-1	20.416	2707
25	Folpet	15.426	2105	54	Bitertanol-2	20.532	2720
26	Quinomethionate	15.609	2126	55	Fenbuconazole	21.256	2798
27	Diclocimet-2	15.640	2129	56	Silafluofen	22.404	2903
28	Trichloride	15.724	2138	57	Pyrazoxyphene	24.369	3045
29	Hexaconazole	16.102	2180	58	Famoxadone	25.472	3112

PL2005 pesticide GC/MS Mix VI



Peak No.	Compound	Retention time (min)	Retention index	Peak No.	Compound	Retention time (min)	Retention index
1	Tachigaren	6.084	1193	28	Dithalimphos	15.928	2161
2	Neristoxin	6.938	1283	29	Chlorthiophos-1	16.820	2263
3	EPTC	7.769	1364	30	Chlorthiophos-2	16.982	2281
4	Butyrate	8.555	1438	31	Diniconazole	17.027	2287
5	Chlormefos	8.672	1449	32	Chlorthiophos-3	17.212	2308
6	Clothianidin	9.242	1501	33	Azamethifos	17.447	2337
7	Crimidine	9.532	1528	34	Lenacil	17.679	2365
8	Orthophenylphenol	9.538	1528	35	Chloridazon	17.746	2373
9	Xyllyl carb	10.385	1606	36	Pyraflufen ethyl	17.786	2377
10	Fenmedifam decomposition product	10.808	1645	37	Clomethoxyphene (Clomethoxynyl)	18.480	2464
11	2,6-Dichlorobenzamide	11.157	1678	38	Indanofan	18.990	2528
12	Sulfotepp	11.353	1696	39	Phenothrin-1	19.083	2541
13	Dioxathion decomposition product	12.250	1781	40	Phenothrin-2	19.180	2553
14	Pyrimethanil	12.502	1805	41	Leptophos	19.411	2583
15	Prohydrojasmon-1	12.660	1821	42	Amitraz	19.586	2606
16	Prohydrojasmon-2	12.961	1850	43	Azimphoethyl	20.012	2658
17	Tebupirimphos	12.988	1853	44	Dialyphos	20.126	2672
18	Ethyl MCPB	13.090	1863	45	Spirodiclofen	20.560	2723
19	Benflesete	13.260	1880	46	Oxosporconazole	20.562	2723
20	Oxosporconazole formyl decomposition product	13.387	1892	47	Dioxathion	20.903	2760
21	Terbucarb	13.508	1904	48	Xalofop Ethyl (Kizalofop P Ethyl)	21.927	2860
22	Cinmethylin	13.781	1932	49	Pilacrostrobin	23.305	2973
23	Fenpropimorph	14.477	2004	50	Fenvalerate-2 (esfenvalerate)	23.641	2999
24	Carbetamide	14.493	2005	51	Dimethomorph-1	25.521	3115
25	Thiamethoxam decomposition product	14.817	2040	52	Tolfenpyrad	25.693	3124
26	Ethychlozate	15.111	2071	53	Dimethomorph-2	26.279	3154
27	Ferrimzone	15.442	2107	54	Flutiacet methyl	27.970	3234

PL2005 pesticide GC/ MS Mix VII



Peak No.	Compound	Retention time (min)	Retention index	Peak No.	Compound	Retention time (min)	Retention index
1	Chloroneb	9.430	1519	28	Tricyclazole	16.237	2195
2	Isoprocarb	9.741	1547	29	Carboxin	16.418	2216
3	XMC	9.972	1568	30	Imibenconazole debenzyl	16.418	2216
4	Propoxur	10.539	1620	31	Frampropmethyl	16.425	2217
5	Chlorethoxyfos	10.702	1635	32	(Z)-metminostrobin	16.571	2234
6	Diarate-1	11.465	1706	33	1,1-Dichloro-2,2-bis(4-ethylphenyl)ethane	16.755	2255
7	Diarate-2	11.643	1723	34	Flufenpyrethylethyl	16.888	2271
8	Carbofuran	11.940	1751	35	Isoxadiphenethyl	17.438	2336
9	Furirazole	11.944	1752	36	Norflurazon	17.661	2362
10	Chlorbufam	11.952	1753	37	Endosulfan sulfate	17.745	2373
11	Chromazone	12.103	1767	38	Hexazinone	17.927	2394
12	Propazine	12.103	1767	39	Diclofop-methyl	18.033	2408
13	Benoxachol	13.096	1864	40	Resmethrin-1	18.084	2414
14	Spiroxamine-1	13.521	1906	41	Resmethrin-2 (bioresmethrin)	18.180	2426
15	2-(1-naphthyl)acetamide	13.943	1949	42	Zoxamide	18.305	2442
16	Spiroxamine-2	14.058	1961	43	Epoxiconazole	18.332	2445
17	Etofmesate	14.112	1966	44	Mefenpyrdiethyl	18.367	2449
18	Isophenphosoxone	14.597	2017	45	Acetamiprid	18.570	2475
19	Clozolinatate	15.190	2080	46	Picolinaphene	18.718	2493
20	Zoxamide decomposition product	15.190	2080	47	Methoxychlor	18.798	2504
21	Thiabendazole	15.200	2081	48	Phenamidon	18.911	2518
22	Chlorbenside	15.515	2115	49	Oryzalin	20.330	2698
23	Bromophosphoethyl	15.670	2132	50	Fluridone	22.678	2924
24	Disulfotone sulfone	15.797	2146	51	Full microrack pentyl	25.162	3095
25	Imazametabenzmethyl	15.947	2163	52	Imibenconazole	26.936	3188
26	Flutriahole	15.956	2164	53	Cinidone ethyl	27.549	3216
27	TCMTB	15.970	2166				

The retention index is a relatively representative index of the retention ratio of straight-chain alkanes in the target compounds based on the number of carbon, and is extremely useful information for qualitative analysis.

The retention index can be determined by isothermal and thermal rise analysis because the logarithm of the retention ratio and the retention ratio of straight-chain alkanes is linearly related to the number of carbons.

In the case of temperature programming...

Because the retention ratio of straight-chain alkanes is linearly related to the number of carbons in straight-chain alkanes, the retention index is given by the following equation.

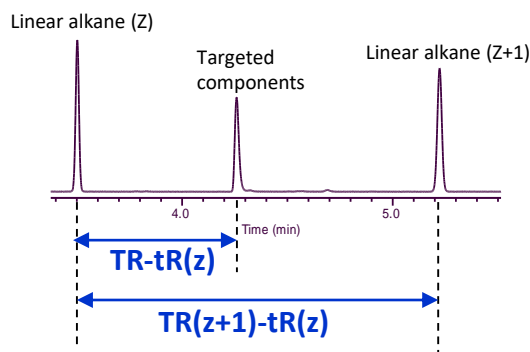
$$\text{Retention index } I = 100 \times \frac{\text{TR} - tR(Z)}{\text{TR}(Z+1) - tR(Z)} + 100 \times Z$$

TR = retention time of the target component

TR(Z) = retention time of straight-chain alkanes that precede the components of interest

TR(Z+1) = retention time of straight-chain alkanes emerging after the components of interest

Z = number of carbons in straight-chain alkanes with a retention time tR(Z)



Reference

Věra Pacáková and Ladislav Feltl, Chromatographic retention indices an aid to identification of organic compounds(1992)ELLIS HORWOOD LIMITED



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