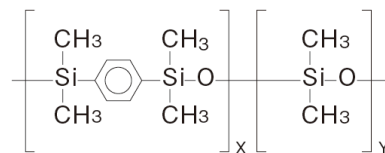


Analytical and Retention Indicators of Pesticide Residues in Foods - Using InertCap 5MS/Sil-

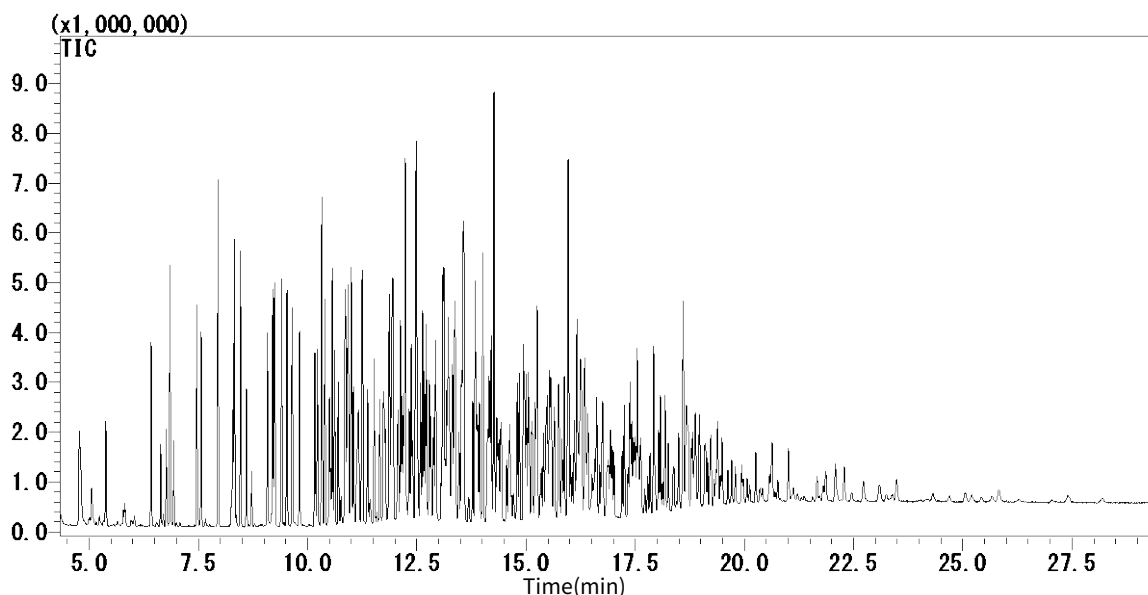
The retention time and retention index of pesticide residues in foods were determined using capillary GC with an InertCap 5 MS Sil column,

InertCap 5 MS Sil is a micropolar column chemically bonded to 5% phenyl-95% methyl polysilalene. The reagents used were PL2005 agrochemicals GC/ MS Mix I, II, III, IV, V, VI, and VII of Hayashi Pure Chemical Ind., Ltd.. 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 for each group of PL2005 pesticide GC/ MS Mix I-VII.



Structural formula of InertCap 5 MS/Sil liquid phase.

Equivalent: DB-5ms, Rxi-5 Sil MS, VF-5ms, SLB-5ms



Conditions

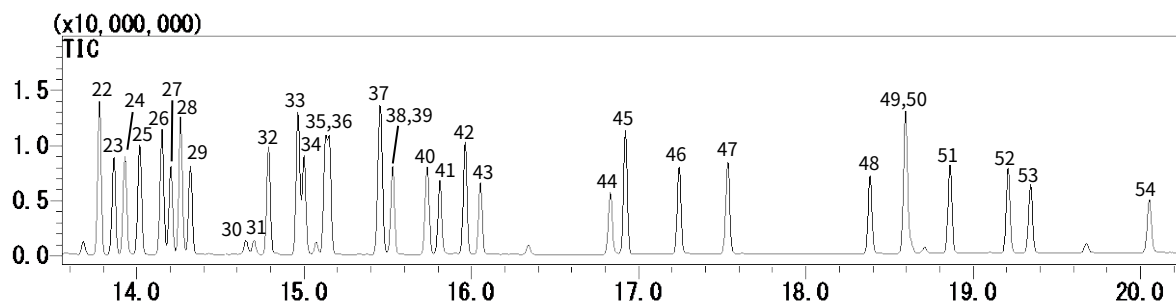
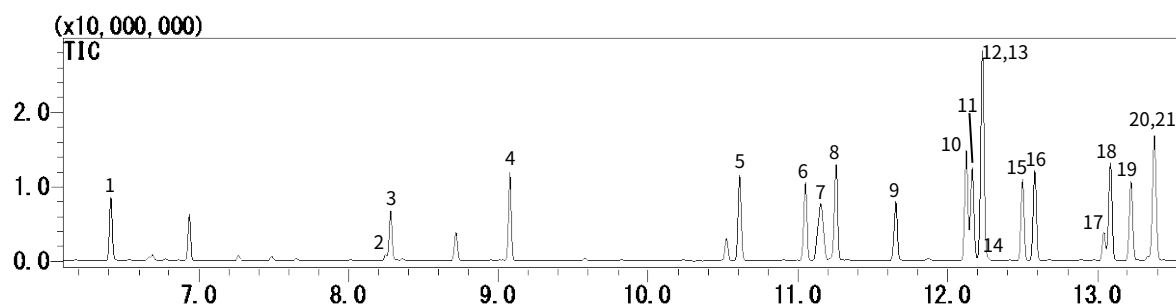
System	: GC - MS
Column	: InertCap 5MS/Sil 0.25 mm I.D. × 30 m, df = 0.25 μm (Cat. No. 1010-15142)
Col. Temp.	: 50 °C(1 min hold) - 25 °C/min-125 °C - 10 °C/min - 280 °C
Carrier Gas	: He 40 cm/sec (constant linear velocity)
Injection	: Splitless 1 min 250 °C
Liner	: Splitless liners (Cat. No. 3001-16329,5 bottles)
Interface Temp.	: 280 °C
Detection	: MS Scan (m/z : 45-450)
Ion source	: 230 °C
Inj. Vol.	: 1 μL
Sample	: PL2005 pesticide GC/ MS MixI~VII 2 ppm

GL Sciences GC Technical Note

*Group names of the reagents containing each component PL2005 the X part of the pesticide GC

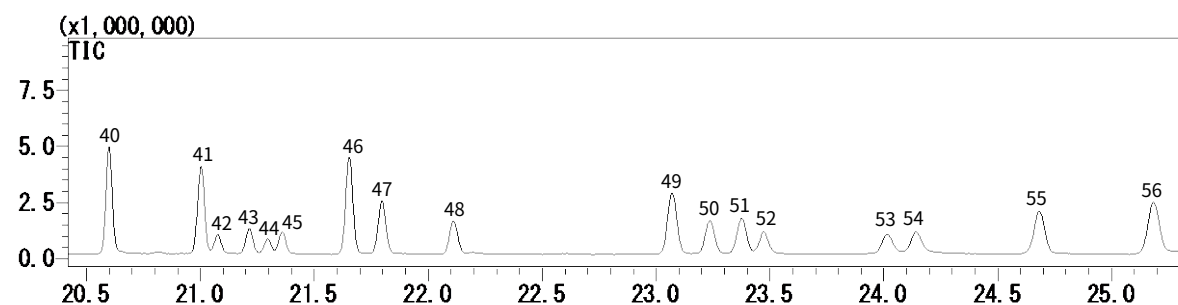
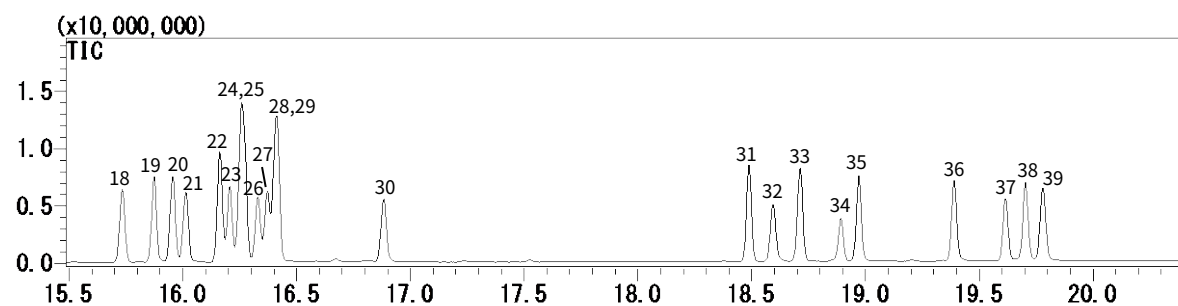
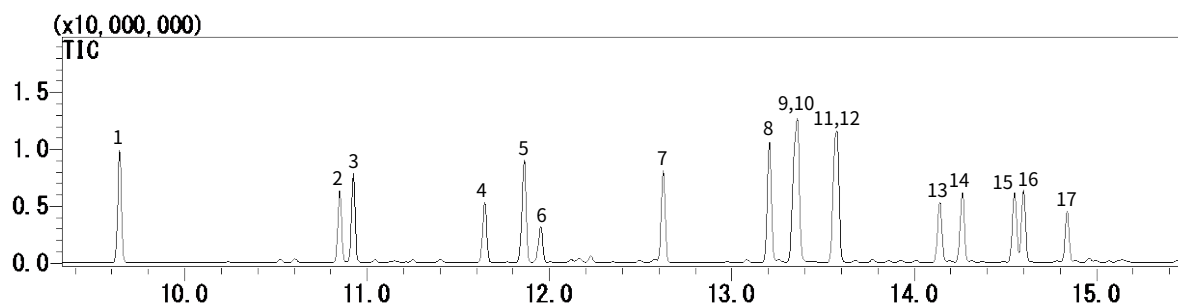
Compound	Retention index	Compound	Retention index	Compound	Retention index	Compound	Retention index
DCIP	1054	IV Benflesete	1877	VI Endosulfan	2149	II Acetamidrid	2470
Clofentedine digest	1180	V Terbucarb	1879	VI Butamifos	2149	I Bifenthrin	2470
Naphthalene-d8	1198	I.S. Propanil	1881	V Dithalimphos	2154	VI Bromconazole-1	2472
Tachigaren	1201	VI Acetochlor	1882	IV Fenamiphos	2157	I Phosmet	2481
Dichlorvos	1244	I Bromobutide	1886	II Imazametabenzmethyl 1	2158	VII EPN	2483
Allyldoctor	1289	IV Chlorpyrifos-methyl	1887	I Flutriahole	2160	VI Bromopropylate	2483
Neristoxin	1290	VI Metribuzin	1890	V Imazametabenzmethyl 2	2162	VII Tetramethrin-2	2483
Dichlobenil	1349	III Oxospoconazole formyl decomposition product	1892	VI Napropamide	2163	IV Piperophos	2483
EPTC	1361	VI Vinclozolin	1894	III Flutolanil	2164	II Picolinaphene	2485
Diphenyl	1397	V Spiroxamine-1	1897	VII Hexaconazole	2173	V Fenoxycarb	2490
Mevinphos1	1424	I Cimeconazole	1899	II Chlorfenson	2173	II Bifenazate	2492
Mevinphos2	1427	I Alachlor	1901	II Prothiohost	2174	I Etoxazole	2492
Butyrate	1432	VI Parathion methyl	1902	I (E)-metminostrobin.	2174	IV Chrysene-d12	2492
Chlormefos	1445	VI Tolclofomethyl	1903	I Pretilachlor	2174	IV Methoxychlor	2497
Etridiazole	1456	III Simetryn	1911	V Fludioxonil	2174	V Fenpropathrin	2498
Clothianidin	1480	VI Metalaxil (Mephenoxam)	1915	IV TCMTB	2176	VII Phenamidon	2508
Acenaphthene-d10	1499	I.S. Ametryn	1918	V Isoprothiolane	2179	II Tebufenpyrad	2509
Methacryfos	1500	I Phenclorfos	1921	II Profenofos	2184	I Etoxazole metabolite	2513
Chloroneb	1513	VII Prometryn	1922	IV Oxadiazon	2188	III Anilophos	2517
Thiocyclam	1516	V Cinnemethylin	1922	VI Thifluzamide	2189	III Bifenox	2521
Crimidine	1518	V Dithiopyr	1923	II Uniconazole (Uniconazole P)	2194	III Indanofan	2521
Orthophenylphenol	1532	VI Pirimiphos-methyl	1943	I Tricyclazole	2195	VII Bromconazole-2	2526
Isoprocab	1542	VII Terbutryn	1948	IV Tribufos	2196	I Furametpyr	2530
Molinate	1552	II Spiroxamine-2	1950	VII Frampropmethyl	2197	VII Clomeprop	2531
XMC	1568	VII Fenitrothion	1951	I Oxyfluorfen	2199	III Phenothrin-1	2533
OMETHATE	1598	III 2-(1-naphthyl)acetamide	1953	VII Myclobutanil	2200	I Iprodione metabolite	2541
Tecnazene	1599	III Etofmesate	1956	VII Flusilazole	2203	IV Tetradifon	2548
Xylol carb	1606	VI (E)-Dimethylvinphos	1958	I Bupirimate	2203	III Phenothrin-2	2548
Propanol	1613	IV Bromacil	1961	V Buprofezin	2206	I Pentoxazone	2555
Propoxur	1614	VII Esprocarb	1966	IV Kresoxim	2208	II Phosalone	2561
Chlorethoxyfos	1622	VII Dichlofluanid	1966	V Diclobutrazole	2214	II Leptophos	2566
Demeton-S-methyl (methyl demeton)	1628	III Malathion	1967	I (Z)-metminostrobin	2216	VII Cyhalothrin-1	2573
Diphenylamine	1636	IV Metolachlor (S-metolachlor)	1976	IV Imibenconazole debenzyl	2219	VII Azinphosmethyl	2578
Ethoprophos	1640	I Quinoclamine	1980	II Carboxin	2219	VII Pyriproxyfen	2584
Etaflurarin	1648	III Chlorpyrifos	1980	I Azaconazole	2219	II Cyhalofop	2584
Fenmedifam decomposition product	1656	VI Diethofencarb	1983	IV Chlorphenapil	2223	II Furametopyr metabolite	2592
Naled	1662	III Thiobencarb	1985	III Ciflufenamide	2224	II Cyhalothrin-2	2595
Chlorpropham	1662	II (Z)-dimethylvinphos	1986	I Isoxathione	2234	III Mefenacet	2598
Trifluralin	1663	III Chlorthal-dimethyl	1991	III Ciproconazole 1	2237	IV Amitraz	2599
Flucirazole metabolite	1667	IV Fenthion	1992	I Chlorthiophos-1	2240	VI Acrinathrin	2613
Dicrotophos	1668	III Cyanazine	1992	II Ciproconazole 2	2241	IV Pyrazofos	2623
Diclofluanide metabolite	1668	V Fenpropimorph	1994	VI Phenoxany 1	2241	IV Fenarimol	2633
Venfluralin	1669	II Parathion	1998	I Phenoxany 2	2243	IV Azimphoethyl	2654
2,6-Dichlorobenzamide	1676	VI Isophenphosoxone	1999	VII 1,1-Dichloro-2,2-bis(4-ethylphenyl)ethane	2248	VII Diallyphos	2659
Sulfotepp	1677	VI Tetraconazole	2000	IV Nitrofen	2249	V Pyraclophos	2666
Dioxabenzophos (salithione)	1680	I Triadimefon	2003	III Flufenpyrethylethyl	2256	VII Phenoxaprop ethyl (phenoxaprop P ethyl)	2675
Monocrotophos	1685	III Isocarboxophos	2007	III (Z)-pyriminobackmethyl	2259	III Oryzalin	2675
Cassafos	1690	I Nitrotar isopropyl	2009	III Chlorthiophos-2	2262	VI Oxospoconazole	2694
Diarate-1	1699	VII Carbetamide	2010	VI Chloropropylate	2263	V Spirodiclofen	2694
Phorate	1699	I Fthalide	2022	II Chlorbenzylate	2263	IV Bitertanol-1	2703
α-BHC	1711	V Bromophos	2027	II Fensulfothion	2272	I Permethrin-1	2708
Diarate-2	1716	VII Diphenamid	2030	IV Diniconazole	2277	VI Bitertanol-2	2717
Thiometon	1724	III Phosphatase-1	2033	I Endosulfan	2278	II Permethrin-2	2725
Desmedipham decomposition product	1729	IV Phosphatase-2	2037	I Ethion	2282	I Fluquinconazole	2729
Dicloran	1736	II (E)-Chlorphenvinphos	2047	I Oxadixyl	2285	V Pyridaben	2732
Dimethoate	1737	I Thiamethoxam decomposition product	2047	VI Chlorthiophos-3	2290	VI Dioxathion	2735
Furirazole	1745	VII Pendimethalin	2048	III Fluacrilipilim	2292	III Butafenacil	2746
Carbofuran	1747	VII Fipronil	2052	II Meprotil	2314	IV Ethobenzanide	2771
Simazine	1749	IV Cyprodinil	2052	IV Triazophos	2319	I Caffenstrol	2772
Atrazine	1756	II Dimethamethrin	2062	IV Sulprofos	2320	III Cyfluthrin-1	2779
Swep	1758	V Penconazole	2062	III Carfentrasone ethyl	2330	IV Fenbuconazole	2785
Chlorbufam	1759	VII Allethrin-1	2064	III Benaraxyl	2336	IV Cyfluthrin-2	2794
Propazine	1763	VII Isofenphos	2065	I Azamethifos	2336	VI Cyfluthrin-3	2802
Quintozene	1765	III Clozolinat	2065	VII Isoxadiphenethyl	2336	VII Cyfluthrin-4	2808
Dimetipine	1765	II Zoxamide decomposition product	2065	VII Trifloxystrobin	2340	III Cypermethrin-1	2825
Chromazone	1765	VII Allethrin-2	2066	III Chlornitrophenene	2341	V Halfenprox	2834
Dioxathion decomposition product	1775	VI (Z)-chlorfenvinphos	2069	I Carbophenothion	2344	III Cypermethrin-2	2839
Trifluranide metabolite	1775	V (Z)-pyriphenox	2070	III Norflurazon	2349	VII Cypermethrin-3	2847
β-BHC	1776	V Tolyfuranide	2070	V Cyanofenphos	2349	III Flucitrinate-1	2847
γ-BHC (lindane)	1776	V Mecarbam	2074	III Propiconazole-1	2349	IV Cypermethrin-4	2853
Terbufos	1781	I Allethrin-3 (viaallethrin)	2074	III Edifenphos	2354	I Xalofop Ethyl (Kizalofop P Ethyl)	2856
Cyanophos	1785	I Allethrin-4 (viaallethrin)	2077	III (E)-pyriminobackmethyl	2354	III Etofenprox	2873
Propyzamide	1788	III Ethychlozate	2077	VI Quinoxylene	2356	III Flucitrinate-2	2876
Fonofos	1791	I Fentoate	2083	I Pyraflufen ethyl	2361	VI Silafluofen	2892
Diazinon	1791	I Diclocimet-1	2083	V Propiconazole-2	2363	IV Benzo(a)pyrene -d12	2892
Phosphamide-1	1794	I Quinalphos	2085	I Endosulfan sulfate	2365	VII Fluridone	2908
Pyrochlorone	1800	V Procyimidone	2090	III Lenacil	2370	V Pyrimidiphene	2925
Pyrimethanil	1806	VI Triadimenol-1	2091	III Chloridazon	2380	VI Fenvalerate-1	2952
Chlorothalonil	1808	V Captan	2094	V Hexazinone	2385	VII Flumioxazine	2954
Anthracene-d10	1809	I.S. Dimepiperate	2094	IV Tenyl chloride	2389	IV Flualinate-1	2964
Tefluthrin	1815	III Thiabendazole	2097	VII Diflufenican	2399	III Pilacrostrobin	2973
Disulfoton	1815	III Methoprene	2097	V Tebuconazole	2399	IV Flualinate-2	2975
Prohydrojasmon-1	1815	VI Ferrimzone	2104	V Propargitt 1	2400	V Fenvalerate-2 (esfenvalerate)	2982
Isazophos	1817	I Triadimenol-2	2106	III Diclofop-methyl	2401	VII Fenvalerate-2 (esfenvalerate)	2985
Terbacil	1821	IV Folpet	2107	V Propargit 2	2403	V Diphenconazole-1	3018
Etrimphos	1825	I Bromophosphoethyl	2113	VII Resmethrin-1	2406	VII Diphenconazole-2	3026
Tri-allate	1829	II Diclocimet-2	2117	V Piperonyl butoxide	2413	V Pyrazoxyphenene	3031
δ-BHC	1830	V Methidathion	2117	I Nitrilin	2415	V Indoxacarb	3036

PL2005 pesticide GC/ MS Mix I



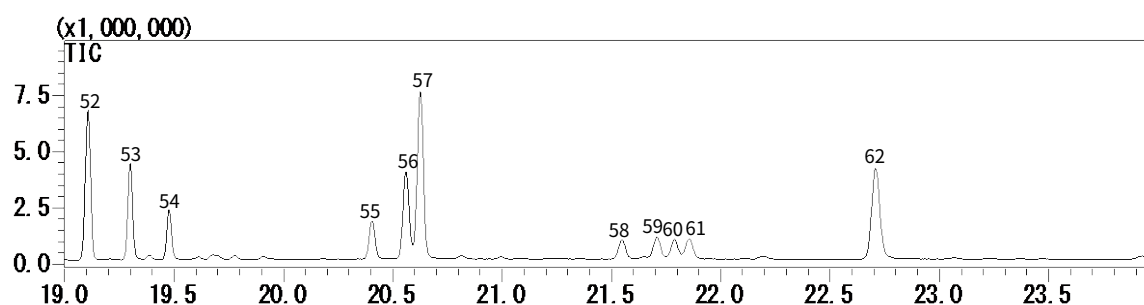
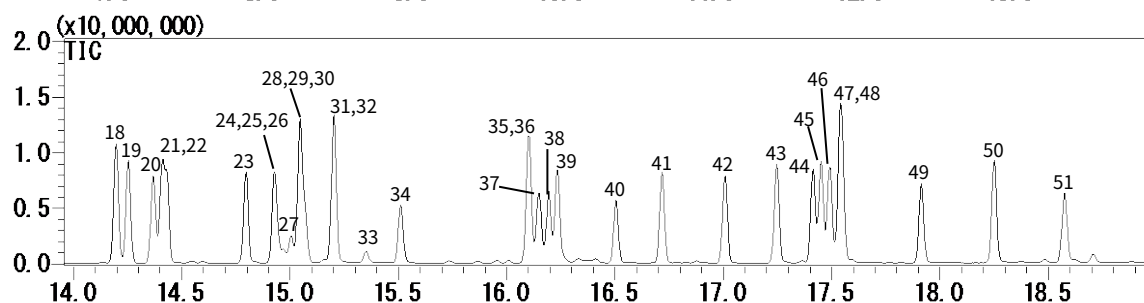
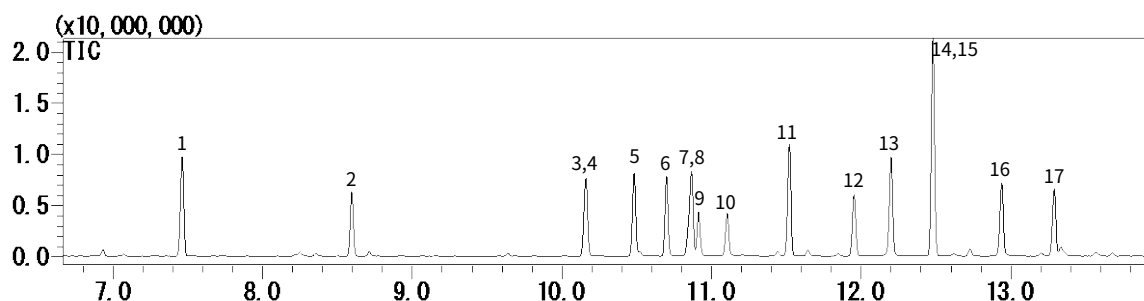
Peak No.	Compound	Retention time (min)	Retention index	Peak No.	Compound	Retention time (min)	Retention index
1	Dichlorvos	6.413	1244	28	Fenthion	14.261	1992
2	Mevinphos1	8.245	1424	29	Parathion	14.319	1998
3	Mevinphos2	8.279	1427	30	Phosphatase-1	14.651	2033
4	Methacryfos	9.076	1500	31	Phosphatase-2	14.697	2037
5	Ethoprophos	10.610	1640	32	(E)-Chlorphenvinphos	14.786	2047
6	Dioxabenzophos (salithione)	11.049	1680	33	Isofenphos	14.962	2065
7	Cassafos	11.151	1690	34	(Z)-chlorfenvinphos	14.998	2069
8	Phorate	11.254	1699	35	Fentoate	15.126	2083
9	Dimethoate	11.653	1737	36	Quinalphos	15.151	2085
10	Terbufos	12.123	1781	37	Methidathion	15.447	2117
11	Cyanophos	12.162	1785	38	Propafos	15.459	2118
12	Fonofos	12.229	1791	39	Tetrachlorvinphos	15.529	2126
13	Diazinon	12.230	1791	40	Butamifos	15.735	2149
14	Phosphamide-1	12.263	1794	41	Fenamiphos	15.810	2157
15	Isazophos	12.500	1817	42	Prothiohost	15.962	2174
16	Etrimphos	12.580	1825	43	Profenofos	16.054	2184
17	Phosphamide-2	13.041	1870	44	Fensulfothion	16.830	2272
18	Diclofenthion	13.084	1874	45	Ethion	16.920	2282
19	Chlorpyrifos-methyl	13.222	1887	46	Triazophos	17.242	2319
20	Parathion methyl	13.373	1902	47	Edifenphos	17.533	2354
21	Tolclofsmethyl	13.382	1903	48	Pyridaphenthion	18.381	2457
22	Pirimiphos-methyl	13.777	1943	49	EPN	18.590	2483
23	Fenitrothion	13.861	1951	50	Piperophos	18.597	2483
24	(E)-Dimethylvinphos	13.928	1958	51	Anilophos	18.861	2517
25	Malathion	14.016	1967	52	Phosalone	19.209	2561
26	Chlorpyrifos	14.149	1980	53	Azinphosmethyl	19.342	2578
27	(Z)-dimethylvinphos	14.201	1986	54	Pyraclophos	20.051	2666

PL2005 pesticide GC/ MS Mix II



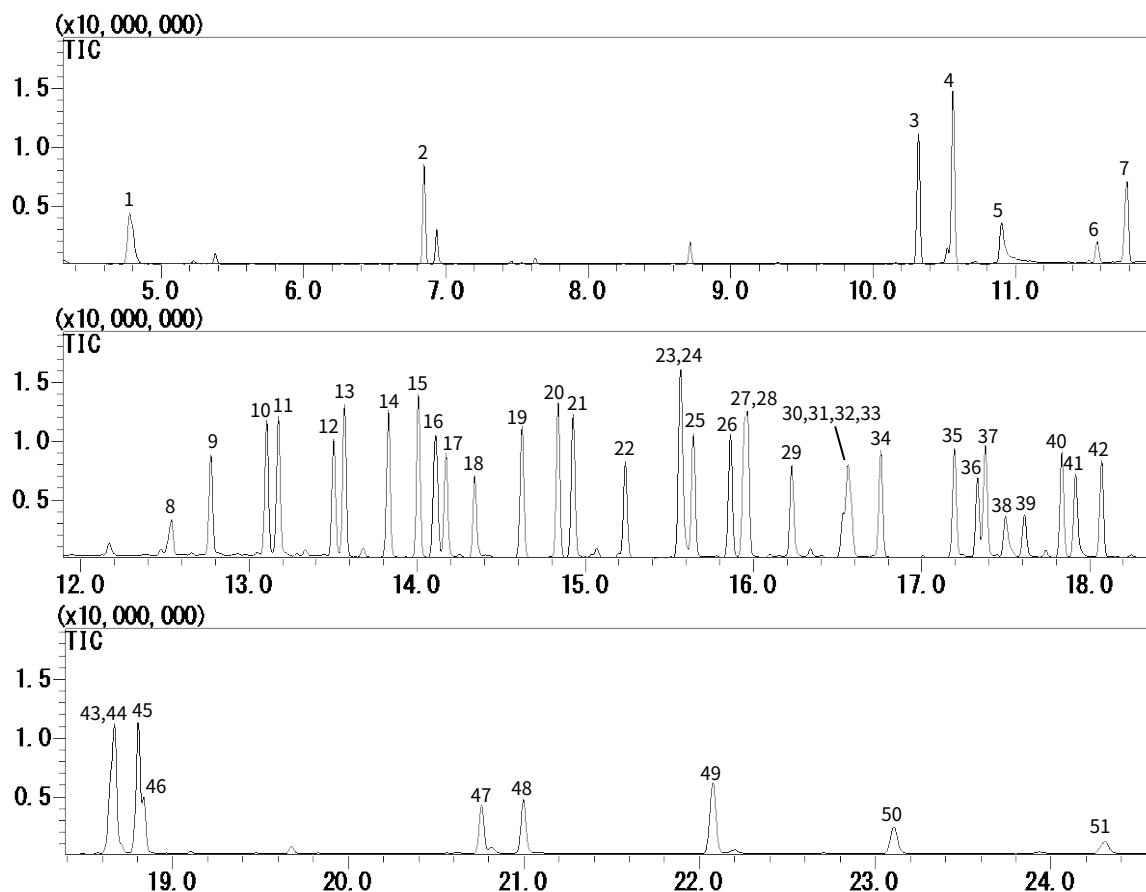
Peak No.	Compound	Retention time (min)	Retention index	Peak No.	Compound name	Retention time (min)	Retention index
1	Molinate	9.640	1552	29	Ciflufenamide	16.417	2224
2	Chlorpropham	10.848	1662	30	Endosulfan	16.883	2278
3	Venfluralin	10.924	1669	31	Bifenthrin	18.488	2470
4	Dicloran	11.644	1736	32	Bromopropylate	18.593	2483
5	Atrazine	11.861	1756	33	Fenpropathrin	18.714	2498
6	Dimetipine	11.952	1765	34	Bifenox	18.892	2521
7	Tri-allate	12.622	1829	35	Clomeprop	18.970	2531
8	Bromobutide	13.205	1886	36	Cyhalofop	19.388	2584
9	Cimeconazole	13.340	1899	37	Acrinathrin	19.615	2613
10	Alachlor	13.361	1901	38	Pyrazofos	19.703	2623
11	Phenchlorfos	13.561	1921	39	Fenarimol	19.778	2633
12	Dithiopyr	13.579	1923	40	Fluquinconazole	20.598	2729
13	Quinoclamine	14.140	1980	41	Caffenstrol	21.003	2772
14	Cyanazine	14.265	1992	42	Cyfluthrin-1	21.076	2779
15	Fthalide	14.550	2022	43	Cyfluthrin-2	21.214	2794
16	Bromophos	14.599	2027	44	Cyfluthrin-3	21.295	2802
17	Fipronil	14.838	2052	45	Cyfluthrin-4	21.360	2808
18	Endosulfan	15.734	2149	46	Halfenprox	21.652	2834
19	Flutolanil	15.875	2164	47	Flucitrinate-1	21.796	2847
20	Chlorfenson	15.957	2173	48	Flucitrinate-2	22.109	2876
21	Isoprothiolane	16.015	2179	49	Fenvalerate-1	23.071	2952
22	Tribufos	16.163	2196	50	Fluvalinate-1	23.235	2964
23	Myclobutanil	16.206	2200	51	Fluvalinate-2	23.376	2975
24	Buprofezin	16.256	2206	52	Fenvalerate-2 (esfenvalerate)	23.474	2982
25	Kresoxim	16.272	2208	53	Diphenconazole-1	24.009	3018
26	Diclobutrazole	16.330	2214	54	Diphenconazole-2	24.138	3026
27	Azaconazole	16.372	2219	55	Deltamethrin (a tralomethrin decomposition product)	24.681	3059
28	Chlorphenapil	16.405	2223	56	Azoxystrobin	25.183	3090

PL2005 pesticide GC/ MS Mix III



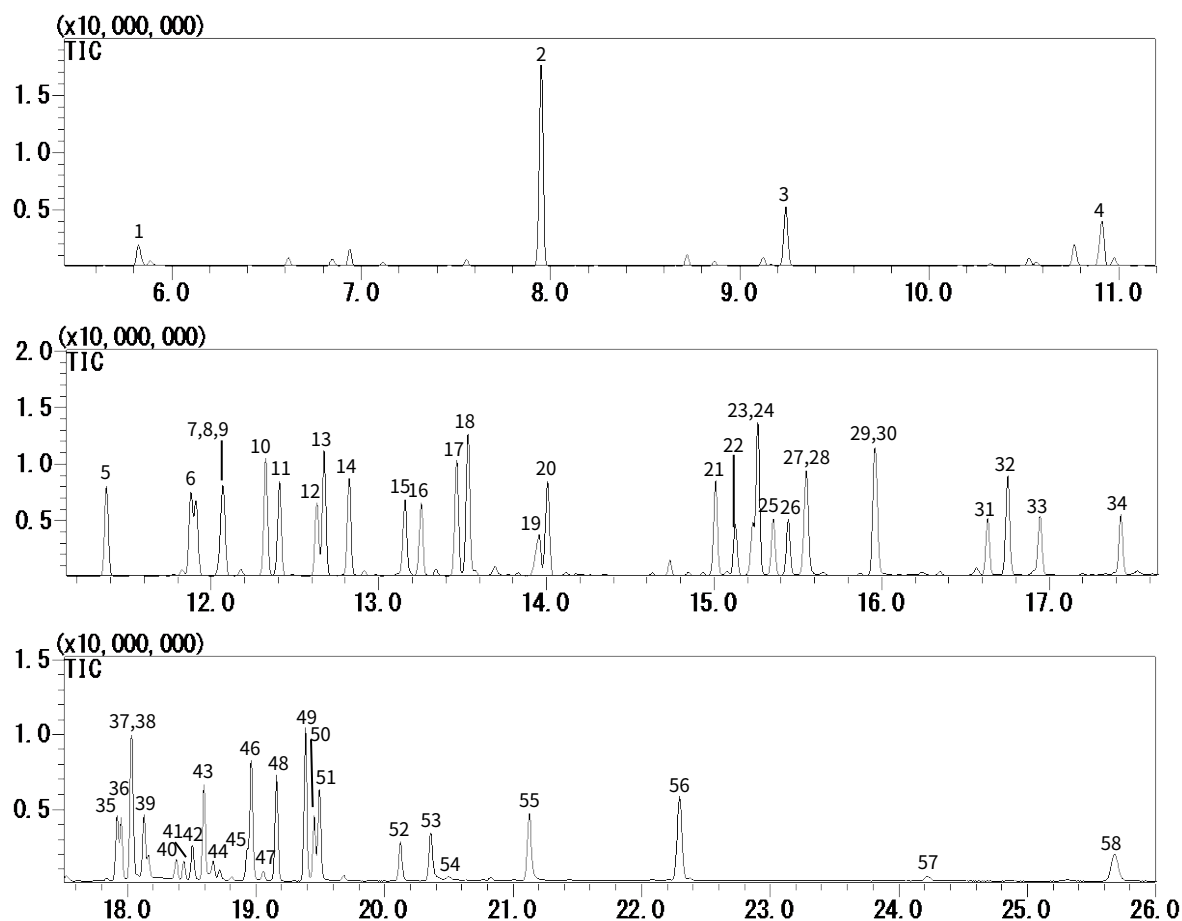
Peak No.	Compound	Retention time (min)	Retention index	Peak No.	Compound	Retention time (min)	Retention index
1	Dichlobenil	7.461	1349	32	Triadimenol-1	15.202	2091
2	Etridiazole	8.594	1456	33	Triadimenol-2	15.350	2106
3	OMETHATE	10.150	1598	34	(E)-Pyriphenox	15.510	2124
4	Tecnazene	10.161	1599	35	Oxadiazon	16.097	2188
5	Demeton-S-methyl (methyl demeton)	10.482	1628	36	Thifluzamide	16.105	2189
6	Etalfurarin	10.698	1648	37	Uniconazole (Uniconazole P)	16.148	2194
7	Naled	10.844	1662	38	Oxyfluorfen	16.193	2199
8	Trifluralin	10.865	1663	39	Bupirimate	16.233	2203
9	Diclotophos	10.912	1668	40	Isoxathione	16.505	2234
10	Monocrotophos	11.104	1685	41	(Z)-pyriminobackmethyl	16.716	2259
11	Thiometon	11.519	1724	42	Fluacrilipim	17.008	2292
12	Quintozene	11.950	1765	43	Sulprofos	17.245	2320
13	Propyzamide	12.200	1788	44	Trifloxystrobin	17.414	2340
14	Tefluthrin	12.479	1815	45	Carbophenothion	17.451	2344
15	Disulfoton	12.479	1815	46	Cyanofenphos	17.491	2349
16	Formothion	12.938	1860	47	(E)-pyriminobackmethyl	17.537	2354
17	Vinclozolin	13.288	1894	48	Quinoxiphen	17.548	2356
18	Thiobencarb	14.196	1985	49	Diflufenican	17.913	2399
19	Chlorthal-dimethyl	14.253	1991	50	Pyributicarb	18.250	2441
20	Triadimefon	14.368	2003	51	Phosmet	18.575	2481
21	Isocarbophos	14.410	2007	52	Tetradifon	19.106	2548
22	Nitrotar isopropyl	14.431	2009	53	Cyhalothrin-1	19.299	2573
23	Pendimethalin	14.796	2048	54	Cyhalothrin-2	19.476	2595
24	Penconazole	14.927	2062	55	Permethrin-1	20.406	2708
25	Allethrin-1	14.945	2064	56	Permethrin-2	20.561	2725
26	Allethrin-2	14.969	2066	57	Pyridaben	20.626	2732
27	(Z)-pyriphenox	15.004	2070	58	Cypermethrin-1	21.552	2825
28	Mecarbam	15.046	2074	59	Cypermethrin-2	21.707	2839
29	Allethrin-3 (via allethrin)	15.046	2074	60	Cypermethrin-3	21.788	2847
30	Allethrin-4 (via allethrin)	15.068	2077	61	Cypermethrin-4	21.858	2853
31	Procymidone	15.200	2090	62	Pyrimidiphene	22.707	2925

PL2005 pesticide GC/ MS Mix IV



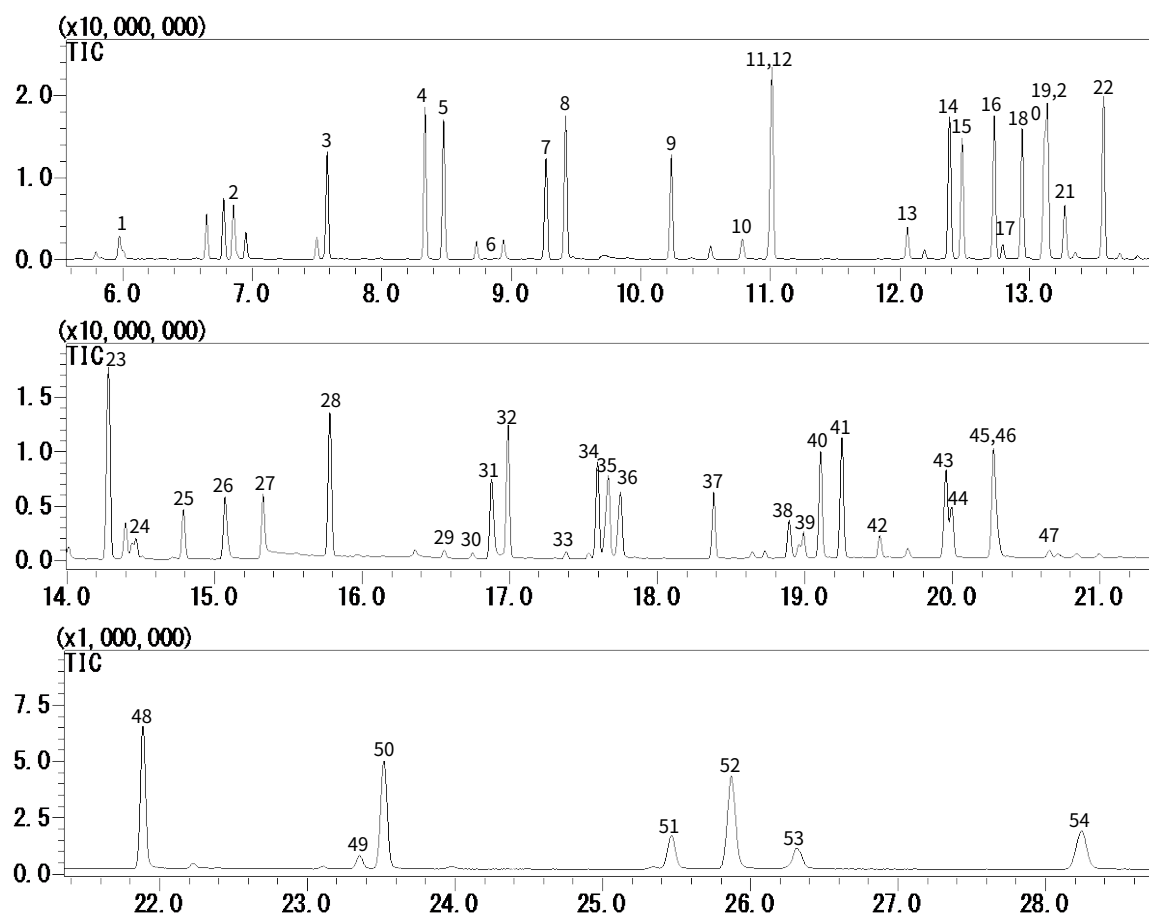
Peak No.	Compound	Retention time (min)	Retention index	Peak No.	Compound	Retention time (min)	Retention index
1	DCIP	4.779	1054	27	(E)-metminostrobin.	15.963	2174
2	Allyldochlor	6.847	1289	28	Pretilachlor	15.965	2174
3	Propanol	10.319	1613	29	Flusilazole	16.226	2203
4	Diphenylamine	10.561	1636	30	Ciproconazole 1	16.530	2237
5	Flucirazole metabolite	10.901	1667	31	Ciproconazole 2	16.559	2241
6	Desmedipham decomposition product	11.575	1729	32	Phenoxanil 1	16.565	2241
7	Simazine	11.783	1749	33	Phenoxanil 2	16.576	2243
8	Terbacil	12.538	1821	34	Chlorbenzylate	16.757	2263
9	Iprobenfos	12.773	1843	35	Mepronil	17.195	2314
10	Dimethenamide (Dimethenamide P)	13.106	1876	36	Carfentrasone ethyl	17.331	2330
11	Acetochlor	13.174	1882	37	Benaraxyl	17.379	2336
12	Metalaxil (Mephenoxam)	13.503	1915	38	Propiconazole-1	17.496	2349
13	Prometryn	13.568	1922	39	Propiconazole-2	17.611	2363
14	Terbutryn	13.829	1948	40	Tenyl chloride	17.833	2389
15	Esprocarb	14.006	1966	41	Tebuconazole	17.916	2399
16	Metolachlor (S-metolachlor)	14.109	1976	42	Resmethrin-2 (bioresmethrin)	18.071	2418
17	Diethofencarb	14.171	1983	43	Fenoxycarb	18.647	2490
18	Tetraconazole	14.341	2000	44	Etoxazole	18.670	2492
19	Diphenamid	14.623	2030	45	Tebufenpyrad	18.804	2509
20	Cyprodinil	14.838	2052	46	Etoxazole metabolite	18.836	2513
21	Dimethamethrin	14.926	2062	47	Butafenacil	20.760	2746
22	Dimepiperate	15.237	2094	48	Ethobenzanide	20.997	2771
23	Butachlor	15.562	2130	49	Etofenprox	22.077	2873
24	Paclobutrazol	15.572	2131	50	Flumioxazine	23.104	2954
25	Fenothiocarb	15.643	2139	51	Indoxacarb	24.307	3036
26	Napropamide	15.863	2163				

PL2005 pesticide GC/ MS Mix V



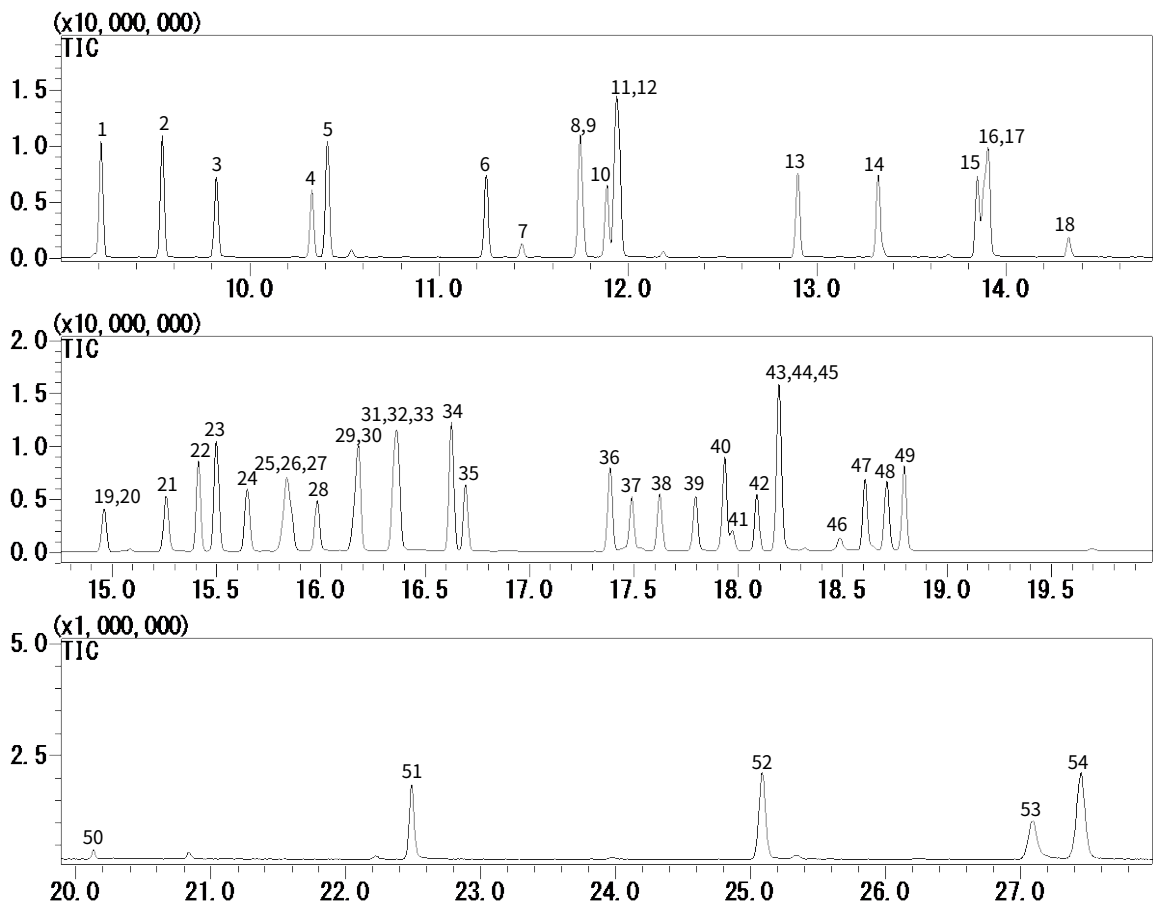
Peak No.	Compound	Retention time (min)	Retention index	Peak No.	Compound	Retention time (min)	Retention index
1	Clofentidine digest	5.823	1180	30	Fludioxonil	15.967	2174
2	Diphenyl	7.951	1397	31	Nitrofen	16.631	2249
3	Thiocyclam	9.243	1516	32	Chloropropylate	16.751	2263
4	Diclofluanide metabolite	10.913	1668	33	Oxadixyl	16.944	2285
5	α -BHC	11.376	1711	34	Chloronitrophenene	17.426	2341
6	Swep	11.878	1758	35	Propargitt 1	17.919	2400
7	Trifluranide metabolite	12.058	1775	36	Propargitt 2	17.950	2403
8	β -BHC	12.072	1776	37	Piperonyl butoxide	18.029	2413
9	γ -BHC (lindane)	12.072	1776	38	Nitralin	18.041	2415
10	Pyrochlorone	12.326	1800	39	Captafol	18.129	2426
11	Chlorothalonil	12.407	1808	40	Iprodione	18.381	2457
12	δ -BHC	12.631	1830	41	Tetramethrin-1	18.440	2464
13	Thioethyl MCPA	12.674	1834	42	Bromconazole-1	18.506	2472
14	Oxabetrinyl	12.824	1848	43	Tetramethrin-2	18.595	2483
15	Propanil	13.157	1881	44	Bifenazate	18.667	2492
16	Metribuzin	13.253	1890	45	Bromconazole-2	18.931	2526
17	Simetryn	13.465	1911	46	Furametpyr	18.963	2530
18	Ametryn	13.531	1918	47	Iprodione metabolite	19.055	2541
19	Bromacil	13.957	1961	48	Pentoxazone	19.160	2555
20	Dichlofluanid	14.006	1966	49	Pyriproxyfen	19.384	2584
21	Tolylfuranide	15.009	2070	50	Furametopyr metabolite	19.453	2592
22	Diclocimet-1	15.126	2083	51	Mefenacet	19.495	2598
23	Captan	15.231	2094	52	Phenoxaprop ethyl (phenoxaprop P ethyl)	20.122	2675
24	Methoprene	15.261	2097	53	Bitertanol-1	20.359	2703
25	Folpet	15.353	2107	54	Bitertanol-2	20.493	2717
26	Diclocimet-2	15.442	2117	55	Fenbuconazole	21.127	2785
27	Trichloride	15.543	2128	56	Silafluofen	22.291	2892
28	Quinomethionate	15.552	2129	57	Pyrazoxyphenene	24.225	3031
29	Hexaconazole	15.954	2173	58	Famoxadone	25.675	3116

PL2005 pesticide GC/ MS Mix VI



Peak No.	Compound	Retention time (min)	Retention index	Peak No.	Compound	Retention time (min)	Retention index
1	Tachigaren	6.005	1201	28	Dithalimphos	15.781	2154
2	Neristoxin	6.856	1290	29	Chlorthiophos-1	16.556	2240
3	EPTC	7.580	1361	30	Chlorthiophos-2	16.746	2262
4	Butyrate	8.335	1432	31	Diniconazole	16.875	2277
5	Chlormefos	8.478	1445	32	Chlorthiophos-3	16.988	2290
6	Clothianidin	8.853	1480	33	Azamethifos	17.383	2336
7	Crimidine	9.269	1518	34	Pyraflufen ethyl	17.594	2361
8	Orthophenylphenol	9.421	1532	35	Lenacil	17.666	2370
9	Xylol carb	10.237	1606	36	Chloridazon	17.750	2380
10	Fenmedifam decomposition product	10.783	1656	37	Clomethoxyphene (Clomethoxynyl)	18.381	2457
11	2,6-Dichlorobenzamide	11.004	1676	38	Indanofan	18.893	2521
12	Sulfotepp	11.014	1677	39	Phenothrin-1	18.991	2533
13	Dioxathion decomposition product	12.057	1775	40	Phenothrin-2	19.106	2548
14	Pyrimethanil	12.383	1806	41	Leptophos	19.249	2566
15	Prohydrojasmon-1	12.480	1815	42	Amitraz	19.507	2599
16	Tebupirimphos	12.728	1839	43	Azimphoethyl	19.956	2654
17	Prohydrojasmon-2	12.793	1845	44	Dialyphos	19.995	2659
18	Ethyl MCPB	12.945	1860	45	Oxospoconazole	20.276	2694
19	Benflesete	13.115	1877	46	Spirodiclofen	20.277	2694
20	Terbucarb	13.138	1879	47	Dioxathion	20.658	2735
21	Oxospoconazole formyl decomposition product	13.272	1892	48	Xalofop Ethyl (Kizalofop P Ethyl)	21.887	2856
22	Cinmethylin	13.573	1922	49	Pilacrostrobin	23.352	2973
23	Fenpropimorph	14.282	1994	50	Fenvalerate-2 (esfenvalerate)	23.518	2985
24	Carbetamide	14.440	2010	51	Dimethomorph-1	25.460	3105
25	Thiamethoxam decomposition product	14.787	2047	52	Tolfenpyrad	25.870	3126
26	Ethychlozate	15.070	2077	53	Dimethomorph-2	26.319	3148
27	Ferrimzone	15.327	2104	54	Flutiacet methyl	28.243	3235

PL2005 pesticide GC/ MS Mix VII



Peak No.	Compound	Retention time (min)	Retention index	Peak No.	Compound	Retention time (min)	Retention index
1	Chloroneb	9.213	1513	28	TCMTB	15.982	2176
2	Isoproc carb	9.536	1542	29	Tricyclazole	16.158	2195
3	XMC	9.822	1568	30	Frampropmethyl	16.179	2197
4	Propoxur	10.328	1614	31	(Z)-metminostrobin	16.346	2216
5	Chlorethoxyfos	10.409	1622	32	Imibenconazole debenzyl	16.367	2219
6	Diarate-1	11.249	1699	33	Carboxin	16.369	2219
7	Diarate-2	11.437	1716	34	1,1-Dichloro-2,2-bis(4-ethylphenyl)ethane	16.626	2248
8	Furirazole	11.744	1745	35	Flufenpyrethylethyl	16.691	2256
9	Carbofuran	11.758	1747	36	Isoxadiphenethyl	17.385	2336
10	Chlorbufam	11.887	1759	37	Norflurazon	17.489	2349
11	Propazine	11.934	1763	38	Endosulfan sulfate	17.623	2365
12	Chromazone	11.952	1765	39	Hexazinone	17.794	2385
13	Benoxachol	12.899	1856	40	Diclofop-methyl	17.934	2401
14	Spiroxamine-1	13.323	1897	41	Resmethrin-1	17.970	2406
15	Spiroxamine-2	13.846	1950	42	Resmethrin-2 (bioresmethrin)	18.089	2421
16	2-(1-naphthyl)acetamide	13.881	1953	43	Zoxamide	18.192	2433
17	Etofmesate	13.905	1956	44	Mefenpyr diethyl	18.192	2433
18	Isophenphosoxone	14.331	1999	45	Epoxiconazole	18.199	2434
19	Clozolinat e	14.962	2065	46	Acetamiprid	18.486	2470
20	Zoxamide decomposition product	14.963	2065	47	Picolinaphene	18.606	2485
21	Thiabendazole	15.258	2097	48	Methoxychlor	18.710	2497
22	Bromophosphoethyl	15.412	2113	49	Phenamidon	18.794	2508
23	Chlorbenside	15.499	2123	50	Oryzalin	20.126	2675
24	Disulfotone sulfone	15.646	2139	51	Fluridone	22.485	2908
25	Imazametabenzmethyl 1	15.817	2158	52	Full microrack pentyl	25.080	3083
26	Flutriahole	15.837	2160	53	Imibenconazole	27.082	3186
27	Imazametabenzmethyl 2	15.858	2162	54	Cinidone ethyl	27.448	3204

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 because in isothermal analysis the logarithm of the retention ratio for straight-chain alkanes is linearly related to the number of carbons and the retention ratio is also linear to the number of carbons in thermal rise analysis

In the case of temperature programming...

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

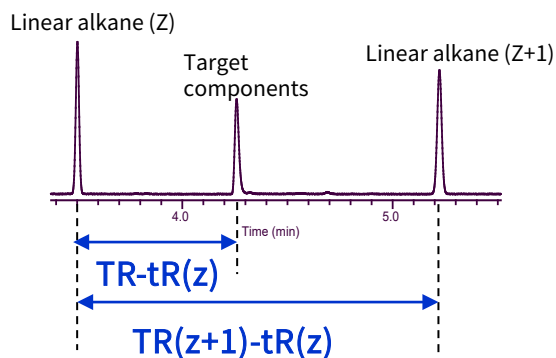
$$\text{Retention index } I = 100 \times \frac{\text{TR} - \text{tR}(Z)}{\text{TR}(Z+1) - \text{tR}(Z)} + 100 \times Z$$

T R = retention time of the target component

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

T R(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 Felzl, Chromatographic retention indices an aid to identification of organic compounds(1992)ELLIS HORWOOD LIMITED



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