



# Rapid-MS, a revolution in chromatography for mass spectrometry

It's fast. It's simple. It's effective. Varian's Rapid-MS combines the flexible, high-performance Saturn® 2000 GC/MS with unique capillary column technology. This new breakthrough for mass spectrometry delivers amazingly fast GC/MS and GC/MS/MS analyses.

## Increased sample-throughput and lower operational costs

Varian's new, patented Rapid-MS technology speeds your sample through the Saturn 2000 GC/MS system.

For temperature programmed separations, the total time for an analysis can be reduced by a factor of 3 to 5. The benefits for isothermal separations are even greater: up to 10 times faster than a conventional GC/MS-system. Rapid-MS technology is based upon the principles of low-pressure capillary gas chromatography generated by the optimal combination of column dimensions and the MS vacuum. Rapid-MS creates a clear path to increased lab efficiency, which translates to lower costs per analysis.



## Fully compatible with standard injector and MS methods

Although the separation is performed under partial vacuum, the injector inlet-pressure is always positive. This requires no changes to the injector procedures and allows you to immediately apply Rapid-MS technology as a replacement to your conventional GC/MS solutions. Select whichever mode of injection is best for your application (Split-, Splitless-, PTV- or Large Volume Injection).

Then challenge Rapid-MS technology to deliver a better analysis on the Saturn 2000 GC/MS and GC/MS/MS.

Its performance, speed, and efficiency will amaze you.

## Suitable for every analysis: from monitoring to screening to confirmation

The Rapid-MS technology can be a workhorse for your lab: a steady, efficient approach to enhanced productivity. Where should you give it a try? Start with a long screening method for pesticides and transform it



into a short screening method. Take a fairly short confirmatory analysis and shorten it even further. Almost any application can benefit from the speed of Rapid-MS technology. Best of all, Varian's Rapid-MS technology is available at the price of a typical transmission quadrupole GC/MS, but its performance far exceeds 'typical'.

## No compromise in data-quality

Precise retention times, quantitative analyses, and spectral quality are all essential for successful and effective GC/MS methods. For fast separations, parameters like carrier gas flow and MS data rate are increasingly critical. Saturn's EFC module ensures precision while the Rapid-MS technology ensures the collection of enough data points per peak to properly quantify your standards and samples. Proof of spectral integrity is available through our library searches using the NIST or Wiley databases. You'll soon see why ion trap MS technology is the fastest growing GC/MS technology today.

## Heightened sensitivity

There are many benefits to using Varian's Rapid-MS technology; high-speed analysis is just one of them.

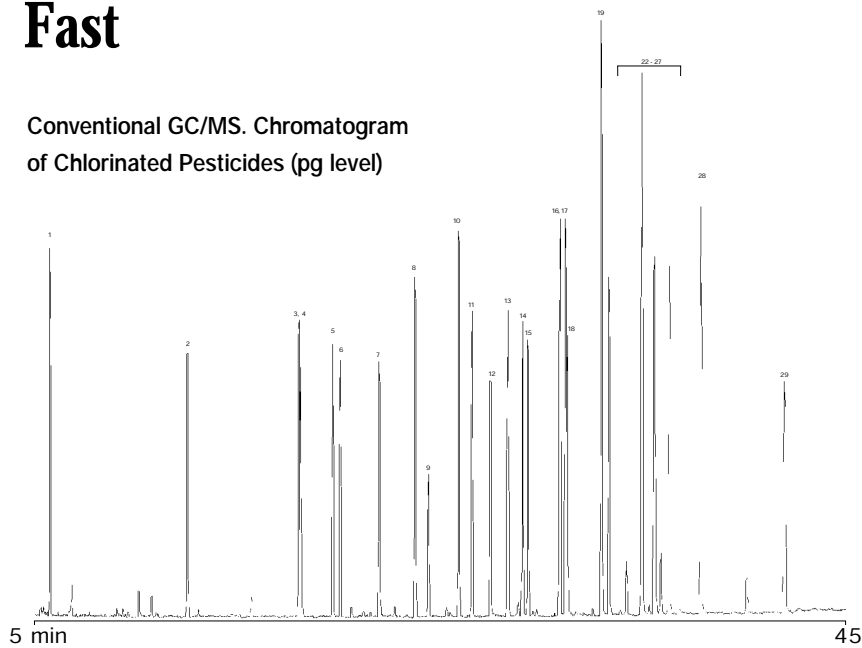
The high-speed analyses generate narrow, taller GC peaks, which translate directly into improved detection limits.

This produces a powerful combination: speed and sensitivity!



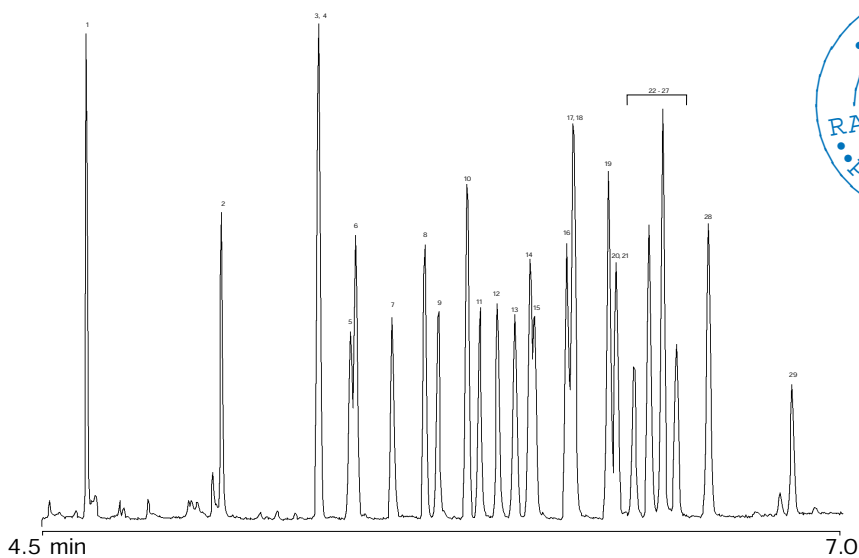
# Fast

Conventional GC/MS. Chromatogram of Chlorinated Pesticides (pg level)

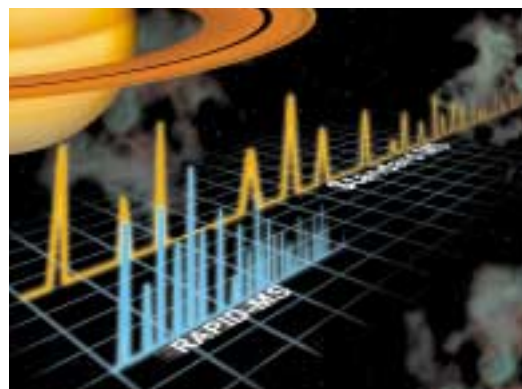
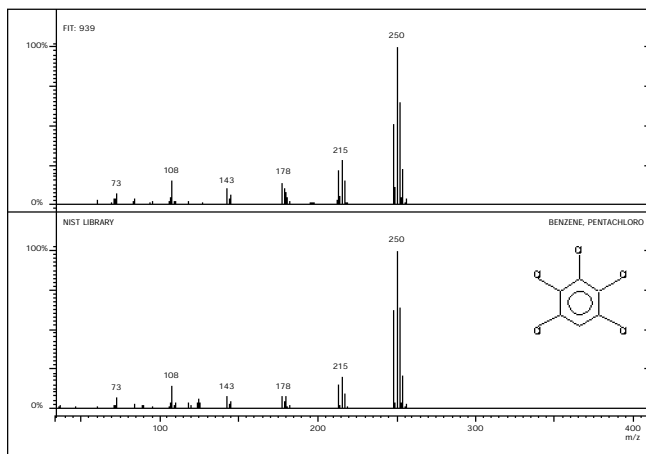


- 1 HCB
- 2 Benzene, pentachloro-
- 3 Benzene, hexachloro-
- 4 a-Lindane
- 5 b-Lindane
- 6 g-Lindane
- 7 d-Lindane
- 8 PCB28
- 9 Heptachlor
- 10 PCB52
- 11 Aldrin-R
- 12 Isobenzan
- 13 Isodrin
- 14 Heptachlor epoxide
- 15 Heptachlor epoxide
- 16 o,p'-DDE
- 17 PCB101
- 18 Endosulfan
- 19 Dieldrin
- 20 p,p'-DDE
- 21 o,p'-DDD
- 22 Endrin
- 23 PCB118
- 24 Endosulfan II
- 25 p,p'-DDD
- 26 p,p'-DDT
- 27 PCB153
- 28 PCB138
- 29 PCB180

Rapid-MS. Chromatogram of Chlorinated Pesticides (pg level)



Rapid-MS. Spectra comparison with the NIST Library



# Repeatable

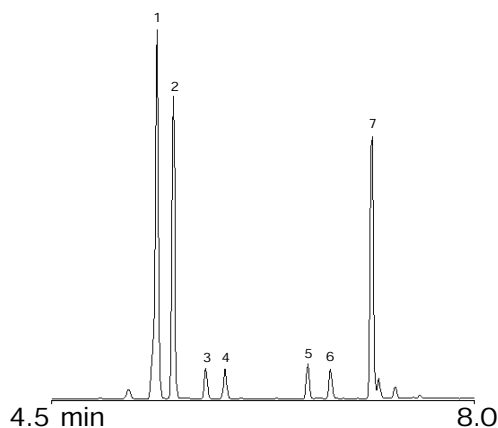
Component	Repeatability of Chlorinated pesticides at pg level on the Rapid-MS									Retention time	
	run 1	run 2	run 3	run 4	run 5	run 6	run 7	Average (Area)	RSD %	Average (min)	RSD %
HCB	136956	145196	142743	150784	145744	145626	143814	144409	2.87	4.988	0.130
g-HCH	287042	299774	284891	290462	287802	299763	291944	291668	2.05	8.281	0.036
PCB 28	407371	409956	412393	413613	416990	410378	424510	413602	1.38	8.892	0.029
Heptachlor	162279	163849	165448	169394	164219	164127	170800	165731	1.90	8.987	0.027
Aldrin-R	75052	74971	74522	74995	75954	76559	74969	75289	0.94	9.325	0.028
o,p'-DDE	278804	275167	271792	265303	274856	275882	273156	273566	1.56	10.018	0.024
Endosulfan I	135877	126650	136010	131776	133703	132577	137145	133391	2.67	10.062	0.031
Dieldrin	33977	35143	37643	35986	35071	33282	35949	35293	4.05	10.325	0.036
o,p'-DDD	662979	654640	664941	648128	659211	667974	664943	660402	1.05	10.392	0.024
PCB 180	242940	247788	245361	240409	247790	248148	248053	245784	1.24	11.683	0.021

# Reliable

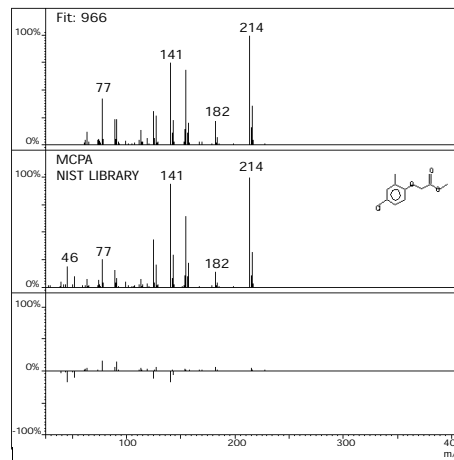
Comparison of identification between a conventional GC/MS and Rapid-MS.

Peak	Component	Conventional GC/MS		Rapid-MS	
		Sim	RSIM	Sim	RSIM
1	MCPP	843	867	780	813
2	MCPA	897	943	835	891
3	2,4-DP	778	818	855	878
4	2,4-D	692	791	844	894
5	2,4,5-TP	728	789	848	859
6	2,4,5-T	682	733	865	876
7	Dinoseb	769	805	803	823

Chromatogram of a methylated Herbicide analysis (ng) on the Rapid-MS

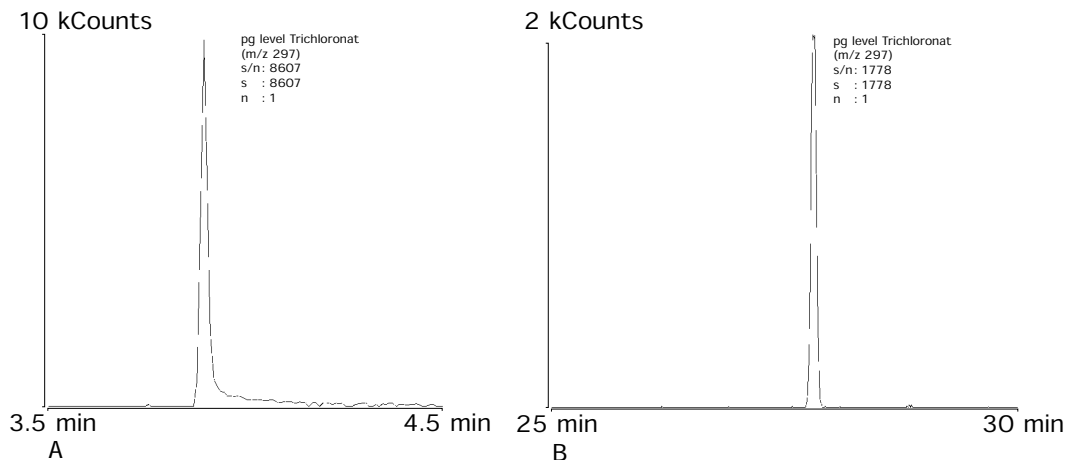


Spectra comparison of MCPA from the Rapid-MS and NIST.



# Sensitive

Signal to Noise data of Trichloronat  
a. on the Rapid-MS  
b. on a conventional GC/MS



# Available Rapid-MS Application Data-sheets

- Nitrogen pesticides
- Phosphor pesticides
- Chlorinated Pesticides
- Arochlors 1242, 1254 and 1260
- EPA method 8150, Chlorinated Herbicides
- Poly Aromatic Hydrocarbons (PAH)
- Drugs, TMS derivatives
- Fatty Acid Methyl Esters (FAME)
- .....

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