

SHORT COMMUNICATION

"PARAFILM": A CONVENIENT SOURCE OF *n*-ALKANE STANDARDS FOR THE DETERMINATION OF GAS CHROMATOGRAPHIC RETENTION INDICES

P. GASKIN and J. MACMILLAN

Department of Organic Chemistry, The University, Bristol

and

R. D. FIRN and R. J. PRYCE

Department of Physical Sciences and Department of Horticulture, Wye College, University of London, Nr. Ashford, Kent

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Abstract—The series of *n*-alkanes from "Parafilm" is convenient for the determination of GLC retention indices. Some retention indices of methyl abscisate and sterols are recorded.

THE SYSTEM of Kovats Retention Indices¹ for the recording of retention characteristics of various types of substance on GLC stationary phases has gained international acceptance.²⁻⁴ This system, whereby retention times are related to retention times of *n*-alkanes, reduces the requirement for collections of often rare and unobtainable reference compounds. Unfortunately, however, suitable collections of *n*-alkanes, especially the higher *n*-alkanes, are often difficult and expensive to obtain. In our laboratories we overcame this obstacle by making use of the series of *n*-alkanes present in "Parafilm",* a widely used thermoplastic sealing material. Simple washing of "Parafilm" with hydrocarbon solvents (e.g. benzene, cyclohexane, hexane, etc.) provides a solution of *n*-alkanes which is suitable for GLC without further purification.

Figures 1 and 2 show temperature programmed and isothermal gas chromatograms of the *n*-alkanes obtained from "Parafilm" on two different stationary phases—SE-30 and OV-17. The retention time of only one pure, and easily obtainable, *n*-alkane (i.e. *n*-tetracosane, Koch-Light Laboratories Ltd.) was required to define all the *n*-alkanes in the "Parafilm" extract.

For the determination of retention indices of a particular group of substances the whole series of "Parafilm" *n*-alkanes may be inconvenient. In these cases it is possible to select the range of *n*-alkanes required from the whole series by preparative GLC. The highest useful *n*-alkane in the "Parafilm" series is *n*-C₃₅ (*n*-pentatriacontane) and it has been found useful

* "Parafilm" Supplied by Gallenkamp, Christopher St., London E.C.2.

¹ E. KOVATS, *Helv. Chim. Acta* **41**, 1915 (1958).

² L. S. ETTRE, *Anal. Chem.* **36**, 31A (1964).

³ R. KAISER, *Chromatographie in der Gasphase*, Part 3, Bibliographisches Institut, Mannheim (1962).

⁴ W. O. MCREYNOLDS, *Gas Chromatographic Retention Data*, Preston Technical Abstracts Co., Evanston, Ill. (1966).

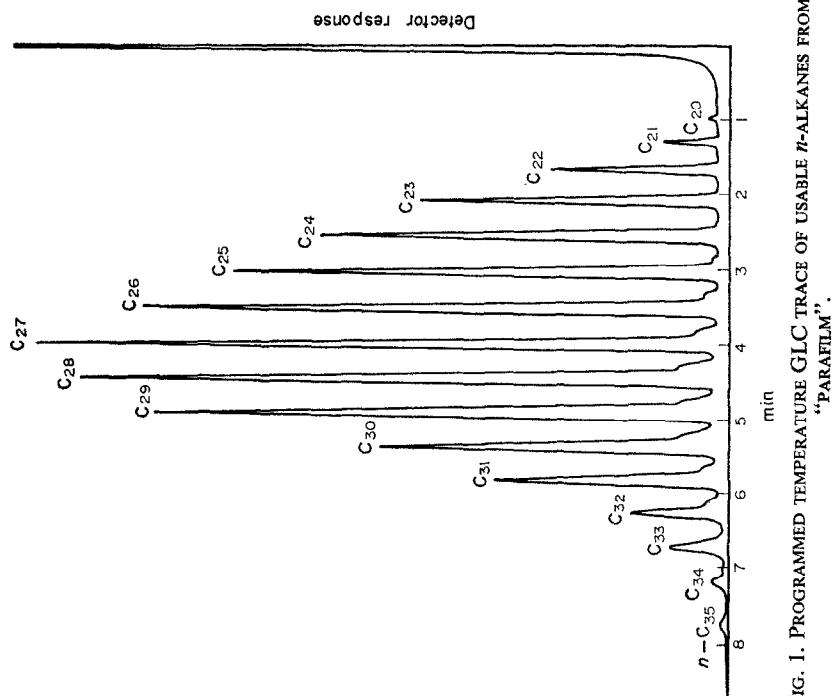


FIG. 1. PROGRAMMED TEMPERATURE GLC TRACE OF USABLE *n*-ALKANES FROM "PARAFILM".

Programme: 200–300° at 16°/min. Column: 3% SE-30 on Gas-Chrom Q (80–100 mesh) packed into a silanized glass column (1.4 m × 4 mm i.d.), nitrogen flow rate 50 ml/min, injection temp. 220°, detector temperature 300°. Instrument: Pye 104 Model 64.

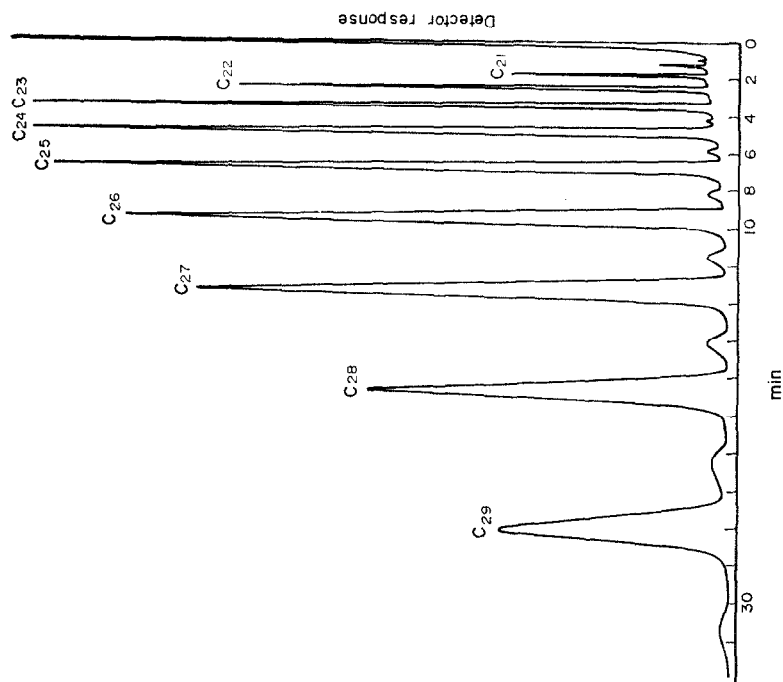


FIG. 2. ISOTHERMAL GLC TRACE OF *n*-C₂₀ TO *n*-C₂₉ *n*-ALKANES FROM "PARAFILM".

Column: 2% OV-17 (2 m × 4 mm i.d.) at 215°. Other conditions as for Fig. 1.

when determining retention indices of substances greater than 3600 to add the easily and cheaply obtainable *n*-C₃₆ (*n*-hexatriacontane) to the series. With this modification the accuracy of extrapolation for the determination of higher retention indices is improved.

In Table 1 we record some retention indices of methyl abscisate and some phytosterols and their biosynthetic precursors which have been determined using "Parafilm" *n*-alkanes.

TABLE 1. GLC RETENTION INDICES OF METHYL ABSICATE AND SOME PHYTOSTEROLS AND THEIR BIOSYNTHETIC PRECURSORS

Substance	Stationary* phase	Retention index	Substance	Retention index Stationary phase	
				1% OV-17†	1.5% XE-60‡
Methyl abscisate	{ 2% QF-1 3% SE-30 1.5% XE-60 2% DEGS 2% OV-17/ QF-1(1:1)	2814	5 α -Cholestan-3 β -ol	3322	3692
		2064	Cholesterol	3325	3693
		2630	Campesterol	3430	3803
		3270	Ergosterol	3440	3823
		2523	Poriferasterol	3456	3822
			Stigmasterol	3460	3818
			β -Sitosterol	3508	3883
			$\Delta^{5,7,22}$ Stigmastatrienol	3515	3978
			Fucosterol	3528	3900
			$\Delta^{5,7}$ - β -Sitostadienol	3536	3910
			28-Isocuposterol	3547	3919
			Cycloeucalenol	3542	3903
			Lanosterol	3455	3850
			Cycloartenol	3583	3923
			β -Amyrin	3544	3893
			Squalene	2943§	2913¶

Instrument and columns are as described in legends to Figs. 1 and 2.

* Column temp. 185° and nitrogen flow rate 50 ml/min except for 2% DEGS which was at 195° and 80 ml/min nitrogen.

† Column temp. 248° and nitrogen flow rate 60 ml/min.

‡ Column temp. 233° and nitrogen flow rate 60 ml/min.

§ Column temp. 234° and nitrogen flow rate 60 ml/min.

¶ Column temp. 205° and nitrogen flow rate 60 ml/min.

It is our hope that the ready availability of *n*-alkane standards from this convenient source, "Parafilm", might encourage the even wider use of the Kovats Retention Indices for the recording of GLC data. At the same time the ease with which *n*-alkanes can be extracted from "Parafilm" should be taken as a warning against the use of this product near samples which are to be analysed by GLC.

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