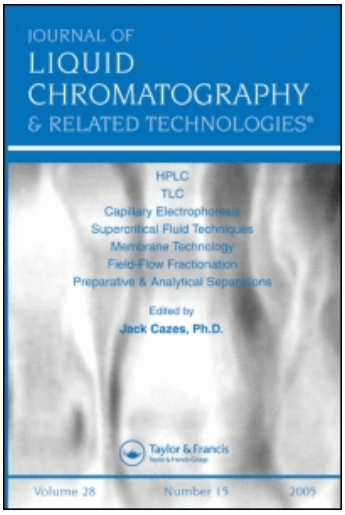

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A Normal-Phase Chromatographic Method to Separate tris(2-Ethyl Hexyl) tri-Mellitate from Other Common Additives of PVC

K. Sreenivasan[a]
[a] Biomedical Technology Wing Sree Chitra Tirunal Institute for Medical Sciences and Technology Poojapura, Trivandrum

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A NORMAL-PHASE CHROMATOGRAPHIC METHOD TO SEPARATE tris(2-ETHYL HEXYL) tri-MELLITATE FROM OTHER COMMON ADDITIVES OF PVC

K. SREENIVASAN
Biomedical Technology Wing
Sree Chitra Tirunal Institute for
Medical Sciences and Technology
Poojapura, Trivandrum-695 012

ABSTRACT

A normal phase chromatographic procedure has been discussed to separate tris(2-ethyl hexyl) tri-mellitate from other three common additives of PVC. The rapid and sensitive method could be employed as a routine procedure for the analysis of commercial materials containing tris(2-ethyl hexyl) tri-mellitate.

INTRODUCTION

Largely due to its advantageous properties, poly(vinyl choloride) (PVC) is perhaps the most widely used material in the biomedical field for storing blood, blood products and intravenous fluids (1). The most serious drawback of PVC is associated with the leaching of its ingredients, particularly

the major plastisizer, di(2-ethyl hexyl) phthalate (DEHP) (2,3). The occurrence of DEHP in intravenous fluids, blood etc as well as its toxic hazards has been discussed widely (4,5). Alternatively, chemicals having less leachability to body fluids have been emerged. Tris (2-ethyl hexyl) trimellitate is one such chemical having comparable plastisizing efficiency of DEHP and is being used in PVC intended for medical uses (6). It appears that a simple rapid chromatographic technique for estimating this plastisizer in presence of other commonly used PVC additives in lacking. This note discusses a normal-phase chromatographic procedure to separate tris (2-ethyl hexyl) trimellitate (TEP) in presence of two common additives of PVC, epoxidized soyabean oil, tris (nonyl phenyl) phosphite and ubiqutous DEHP.

EXPERIMENTAL

DEHP, tris (nonyl phenyl) phosphite (TNP) and epoxidized soyabean oil (Paraplex G62) were obtained from Indo-Nippon to Bombay. Tris (2-ethyl hexyl) tri-mellitate (TEP) (Hatco Ford, NJ) was a gift from Mr.K.Rathinam. Hexane and dichloromethane (Glaxo, India) were HPLC grade and vacuum filtered prior to use.

The chromatographic system consisted of a Waters Assoc. Inc. Model 6000 A solvent delivery pump, U6K injector and R-401 refractive index detector. A μ-Porasil column in conjuction with a mobile phase consisting of n-hexane and CH_2Cl_2 (60:40 v/v) at a flow rate of 1 ml/min was used for separating the components. 10 μl volume of 1% solution of the additives in the mobile phase was injected onto the column. The column effluents were monitored by the RI detector.

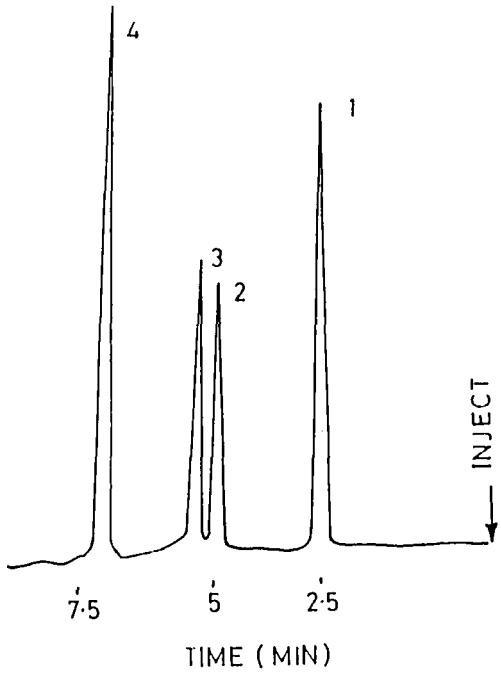

Figure 1 : A typical chromatogram of a mixture of additives

Peaks: 1-Paraplex G62, 2-TEP, 3-DEHP 4-TNP

RESULTS AND DISCUSSION

Fig. 1 illustrates the chromatogram of the four components. Paraplex G62, even though being a mixture of components of various chain lengths and isomers, is unretained and elutes as a single peak under the present chromatographic conditions. The other three components, however, are retained in the column for a varying period of time and elute at 5.0 min (TEP),

5.3 min (DEHP) and 6.8 min (TNP), respectively. It is apparent that the common additives including DEHP are not interfering the separation of TEP. The detection limit of TEP in the present case is 3 μg/ml, which is sensitive enough for the routine estimation.

The chromatographic procedure reported here is rapid and could be used for the analysis of commercial material containing TEP.

REFERENCES

1. Bruck S.D. Med. Progr. Technol., 9 1, 1982.

2. Jaeger R.J. and Rubin R.J. Science, 170 460, 1970.

3. Lawerence W.H. Clin. Toxicol, 13, 89, 1978.

4. Thomas J.A. and Northup S.J. J. Toxicol. Environ. Health, 9, 141, 1982.

5. Phthalate esters, 45, NIH Publication No NIH 82-218, 1982.

6. Kevy S.V., Jacobson M.S. and Harmon W.E., Trans. Am. Soc. Artif. Intern. Organs. 27 386, 1981.