

Patricia Vázquez Loureiro¹, Antía Lestido Cardama¹, Ana Rodríguez-Bernaldo de Quirós¹, Perfecto Paseiro Losada¹ and Raquel Sendón¹

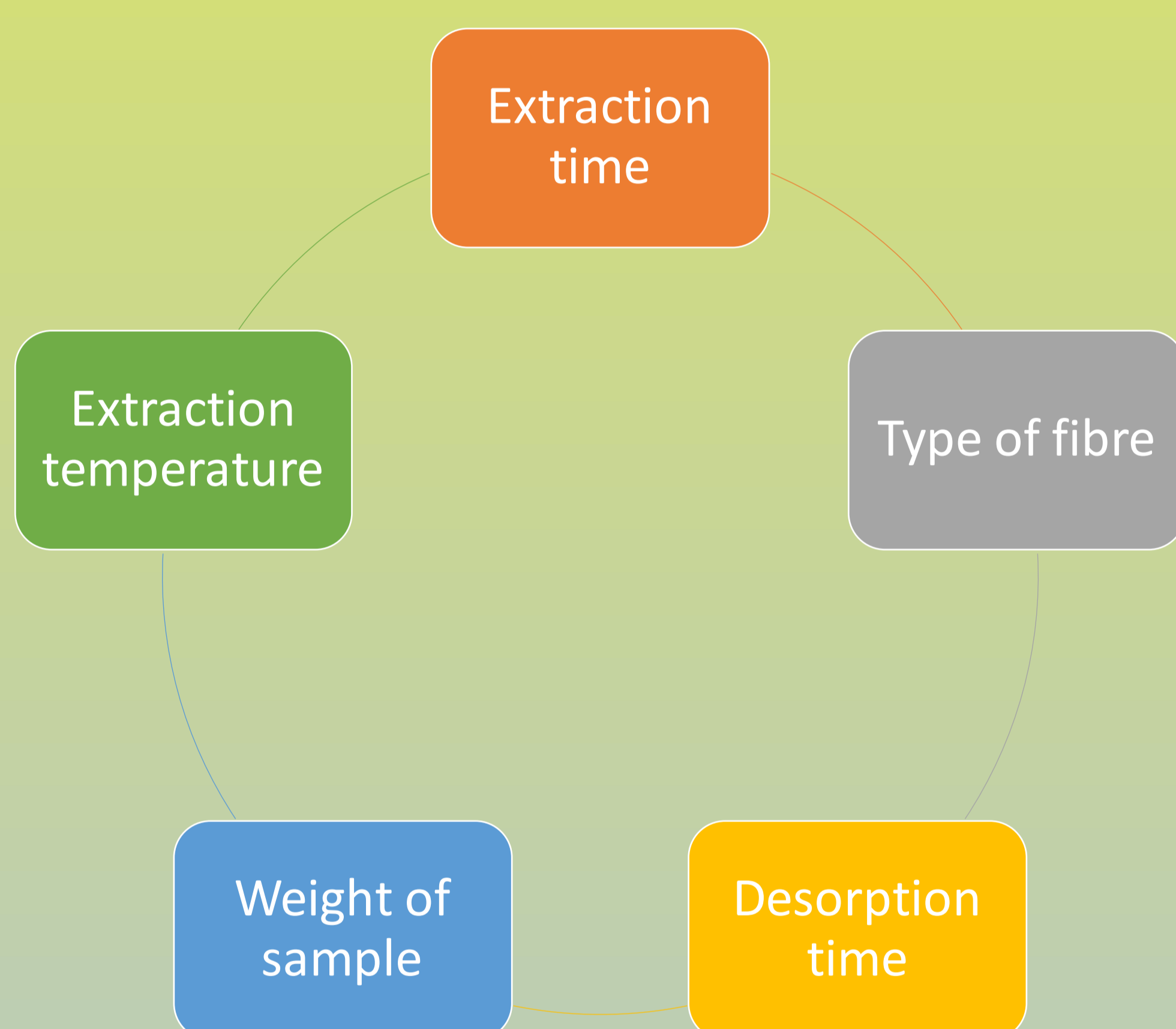
¹Department of Analytical Chemistry, Nutrition and Food Science, Faculty of Pharmacy, University of Santiago de Compostela Spain

INTRODUCTION

Food contact materials can be made of a wide variety of materials such as plastic, metal, coatings, etc. Some examples of polymeric coatings used in food and beverages cans are epoxy resins, phenolic resins, acrylics, polyesters, etc. Used as a protective layer, they are essential to preserve the food maintaining its quality, as well as to protect it from corrosion and avoid a metallic taste [1]. Some chemicals present in these types of materials are susceptible to migrate to the food and constitute a risk for consumers' health.

In the present work, a method based on solid-phase microextraction in headspace mode and gas chromatography coupled to mass spectrometry (HSSPME-GC-MS) was developed for the identification of potential migrants in polymeric coatings of metal food and beverage cans.

SPME PARAMETERS OPTIMIZATION



INSTRUMENTAL EQUIPMENT



EXPERIMENTAL CONDITIONS

CHROMATOGRAPHIC CONDITIONS	
Column:	Rxi-624SiIMS (30 m × 0.25 mm × 1.40 μm)
Injector Temperature (°C)	200
Transfer line Temperature (°C)	250
Inyection volume (μL)	1
Carrier gas flow (He) (mL/min)	1
Ramp Temperature (°C)	45-250
Full scan (m/z)	20-500
Mode of injection	Full scan
SPME CONDITIONS	
Extraction Temperature (°C)	100
Extraction Time (min)	30
Type of fibre	SPME holder for manual sampling and a DVB/PDMS/CAR fibre with 50–30 μm thickness
Desorption Time (min)	10
Equilibration Time (min)	2

Table 1. HSSPME-GC-MS conditions

RESULTS AND DISCUSSION

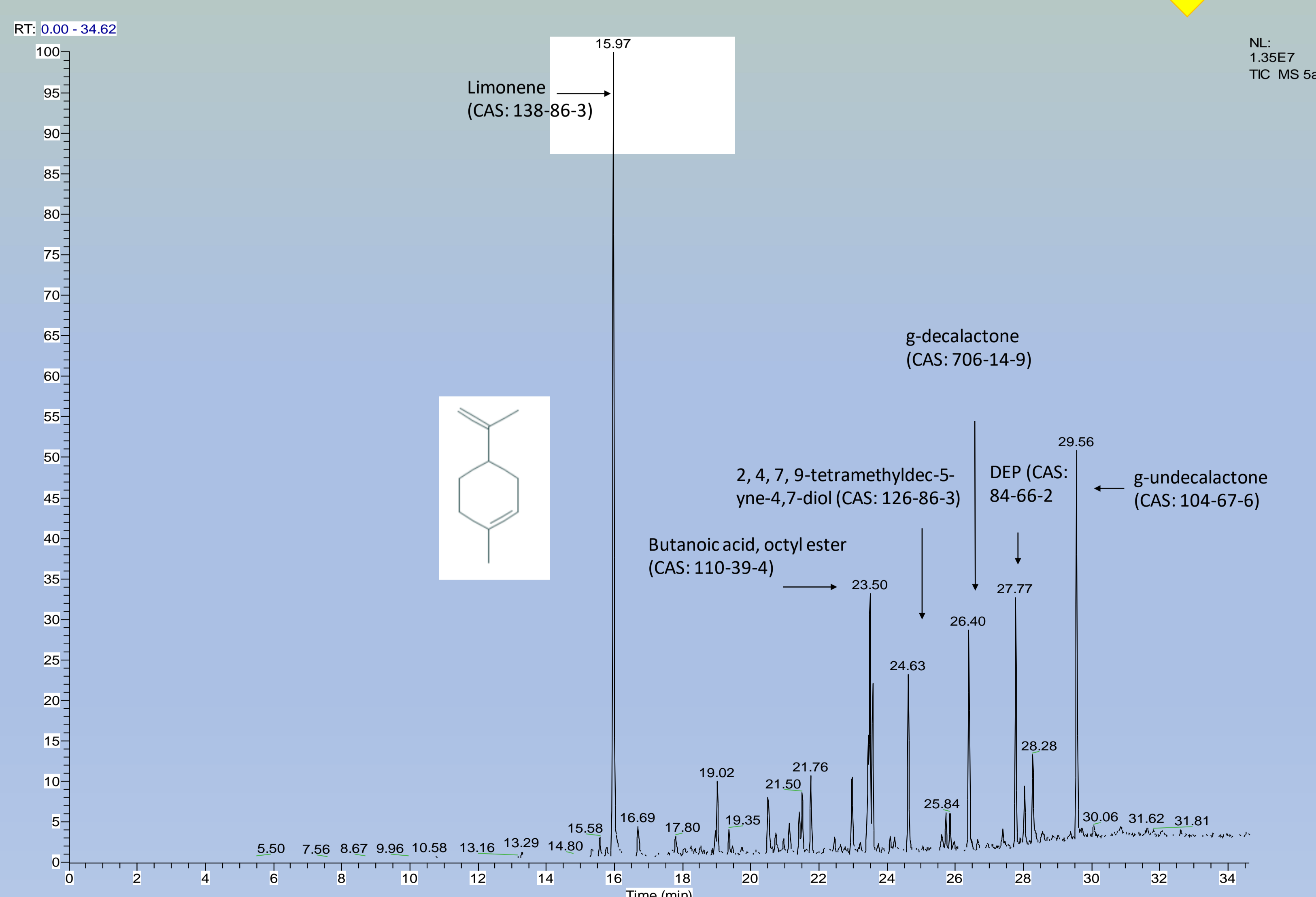


Figure 1. Chromatogram of sample 5 analyzed by SPME

Tr/min	Compound	CAS	SI	RSI
15,97	Limonene*	138-86-3	916	924
18,60	2,4-Hexadienoic acid	110-44-1	920	923
20,92	Benzoic acid*	65-85-0	633	824
22,98	2-Azepanone*	105-60-2	883	889
23,57	Ethyl-decanoate	110-38-3	902	935
24,63	2,4,7,9-Tetramethyldec-5-yne-4,7-diol	126-86-3	874	895
25,54	2,6-di-tert-Butyl-1,4-benzoquinone (2,6-DTBQ)*	719-22-2	729	804
26,40	g-Decalactone	706-14-9	887	912
27,75	Diethyl phthalate*	84-66-2	922	930
29,56	Undecalactone-g	104-67-6	760	841

Table 2. Compounds more abundant (*Substances confirmed with a standard solution)

CONCLUSION

Different compounds including, aldehydes, ethers, alkenes and alcohols among others were identified in preliminary assays.

SPME is a sensible technique to identify volatile compounds.

Aldehydes and aromatic compounds were mainly the compounds identified by SPME using a DVB/PDMS/CAR fibre

References

[1] Cooper I. et al- Surface Coatings International Part B: Coatings Transactions 84(2001) 91.