

# Non-target GC-MS analysis for the identification of semi-volatile compounds in polymeric coatings intended to come in contact with food

Patricia Vázquez Loureiro<sup>1</sup>, Antía Lestido Cardama<sup>1</sup>, Raquel Sendón<sup>1</sup>, Juana Bustos<sup>2</sup>, M<sup>a</sup> Teresa Nieto<sup>2</sup>, Perfecto Paseiro Losada<sup>1</sup> and Ana Rodríguez-Bernaldo de Quirós<sup>1</sup>

<sup>1</sup>Department of Analytical Chemistry, Nutrition and Food Science, Faculty of Pharmacy, University of Santiago de Compostela (Spain)

<sup>2</sup>National Food Center, Spanish Agency for Food Safety and Nutrition, Spain

## INTRODUCTION

Polymeric coatings are used in the food contact surface of metal cans to protect the food from corrosion. Migration of components from the food contact material to the food is a matter of concern from the food safety point of view, special attention has been paid to low molecular weight compounds and particularly to unknown compounds. Its identification is a current challenge in the food packaging field [1].

This study was focused on the identification of semi-volatile low molecular weight compounds present in polymeric coatings for metal food and beverage cans.

Different solvents were tried with the aim to extract compounds with different polarity present in the coating of metal cans.

## SAMPLE EXTRACTION

MeOH:  
24h, 70°C

ACN:  
24h, 70°C

Hexane:  
4h, 60°C

Hexane: EtOH  
(3:1 % v/v) 24h, 20°C

## CHROMATOGRAPHIC CONDITIONS

Column:	Rxi-5SilMS (30 m × 0.25 mm × 0.25 μm)
Injector Temperature (°C)	300
Transfer line Temperature (°C)	300
Injection volume (μL)	1
Carrier gas flow (He) (mL/min)	1
Ramp Temperature (°C)	40-300
Full scan (m/z)	35-500
Mode of injection	splitless

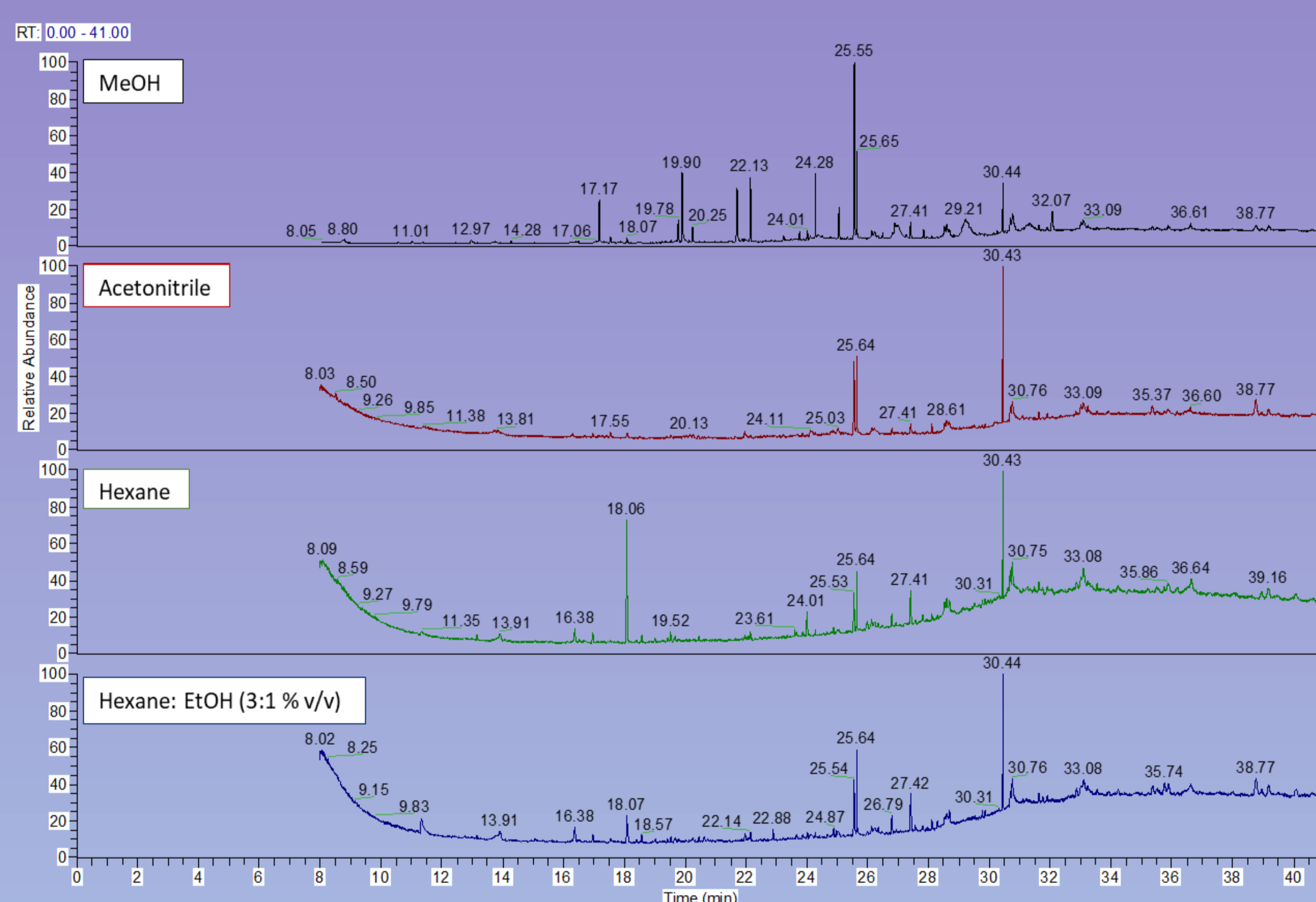


Figure 1. Chromatograms of the sample extraction with different solvents.

Tr/min	Compuesto	CAS	SI	RSI
11.37	2-oxepanone	502-44-3	729	862
12.34	alpha-terpineol	98-55-5	902	936
14.20	isobenzofuran-1,3-dione	85-44-9	918	933
15.58	diol			
16.93	(+)-Ledene	21747-46-6	893	927
18.08	diethyl phthalate	84-66-2	929	938
19.28	dodecalactona	2305-05-7	904	954
20.72	phthalate	84-78-6	714	758
20.99	1-Phenyl-1,2-propanediona	579-07-7	855	922
21.73	2-Isobutyl-5-propylthiophene	4861-63-6	591	643
21.99	oxaspiro			
22.33	phthalate			
23.30	phthalate			
27.19	α-Methyl-δ-oxo-2-phenyl-1,3-dioxolane-2-heptanenitrile	58422-90-5	777	898
27.42	hexa(methoxymethyl)melamine	68002-20-0	857	874

Table 2. Compounds identified by GCMS analysis after extraction with MeOH as solvent.

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Table 1. Chromatographic conditions.

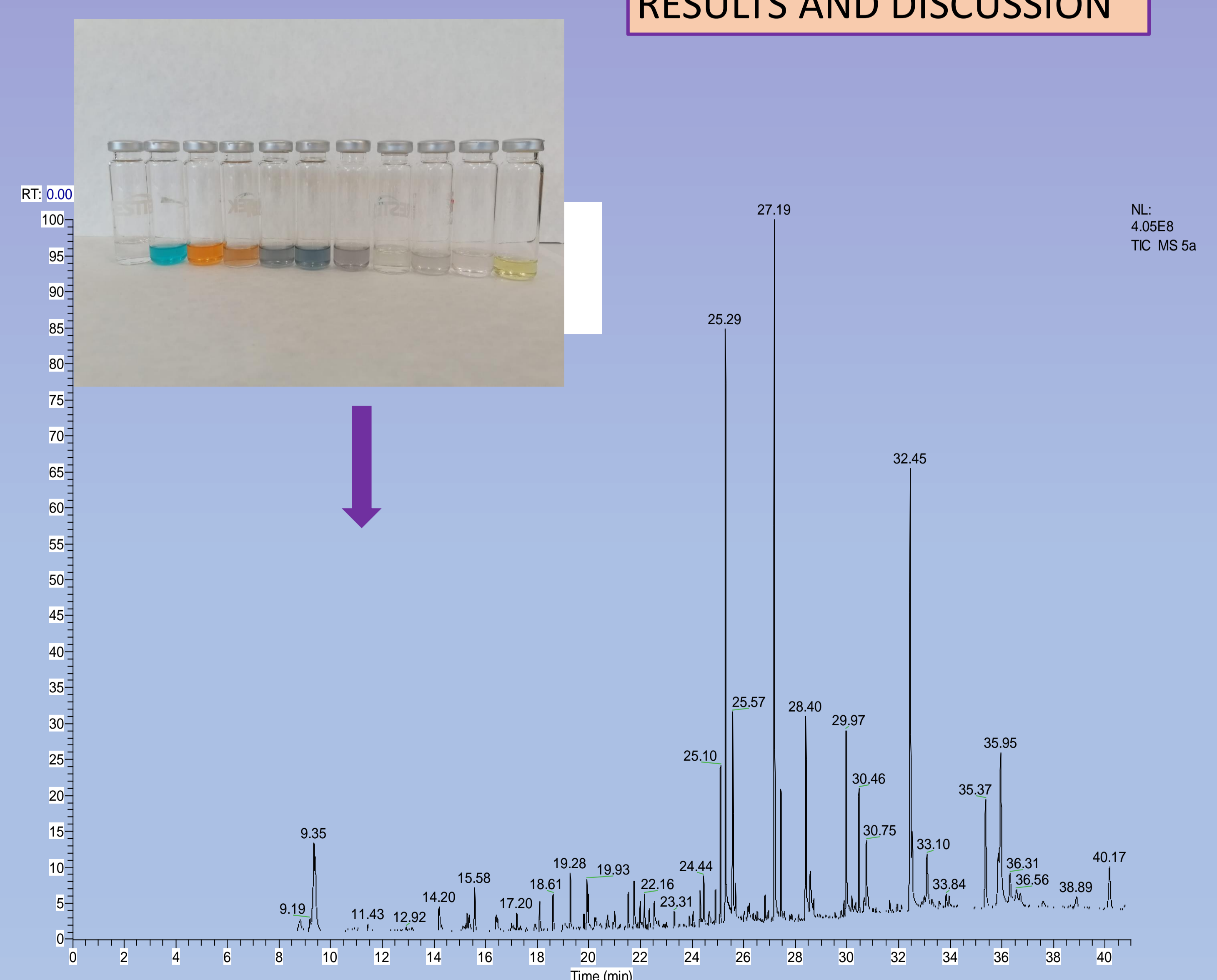


Figure 2. Chromatogram of extraction of sample 5 with methanol and extracts of the analyzed samples.

The preliminary assays showed that esters and alkenes were among the most abundant compounds identified. Some examples of compounds can be seen in table 2.

## References:

[1] EFSA Journal, 6(7):21r, 1-41.