

Analysis of MOSH/MOAH on paper using OPTIC Multimode Inlet with Advanced Liner exchanging with Capping and Decapping Station

Key words:

OPTIC-4

LINEX

Capping and Decapping Station

Mineral Oil Saturated Hydrocarbons

Mineral Oil Aromatic Hydrocarbons

Iwan Horsting / Nikolay Gribov

Introduction

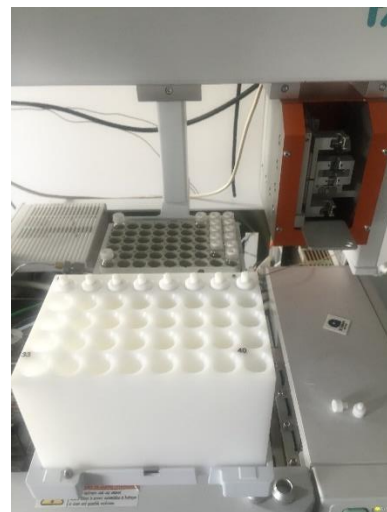
From the 90's, there are reports which warn for the health risks which mineral oil residues can give. The last couple of years the focus on this problem is increasing.

The main issue comes from recycled paper which has old printing ink on it. Mineral Oils were used in this old printing ink. They can migrate into the food, which can lead to health issues.

Therefore legislation is being made to minimize this contamination into our food.

Sample

5 x 2 cm pieces of paper, Paper 1 contains MOSH compounds and the other paper contains MOAH, as show in the pictures:



GL Sciences B.V.

De Sleutel 9, 5652 AS, Eindhoven, The Netherlands
Tel. +31 (0)40 254 95 31 E-mail: info@glsciences.eu
Internet: www.glsciences.eu

The liner with sample is capped on both ends and is placed in the sample rack of the PAL. A sequence is started with the software and samples are analyzed. (YouTube example: <https://youtu.be/gVPltwpMQzo>)

Instrumentation

GC Inlet: OPTIC-4 Multimode Inlet
 Liner: 2414-1003, single-necked liner
 GC-MS: Shimadzu QP2010
 GC column: GL Sciences InertCap 5 MS/Sil, 0.25 m x 30 m, film 0.25 µm

Conditions

OPTIC-4

Method Type	Expert
Equilibration Time	00:05 min:sec
End Time	30:00 min:sec
Initial Temperature	40 °C
Ramp Rate 1	10.0 °C/s
Hold Temperature 1	175 °C
Solvent Cooling Effect	No
Cooling Valve Mode	No
Septum Purge Flow	5 mL/min
Vent Mode	Fixed Time
Vent Time	00:30 min:sec
Carrier Control Mode	Flow Control
Zero LINEX Head Pressure	No
Initial Column Flow	1.0 mL/min
Start Column Flow 1	1.0 mL/min
End Column Flow 1	1.0 mL/min
Column Flow/Inlet Pressure Time 1	01:00 min:sec
Start Column Flow 2	1.0 mL/min
End Column Flow 2	1.0 mL/min
Direct Split Valve Control	No
Initial Split Flow	50.0 mL/min
Split Flow 1	0.0 mL/min
Split Flow Time 1	01:00 min:sec
Split Flow 2	50.0 mL/min

QP2010 GC/MS:

GC:

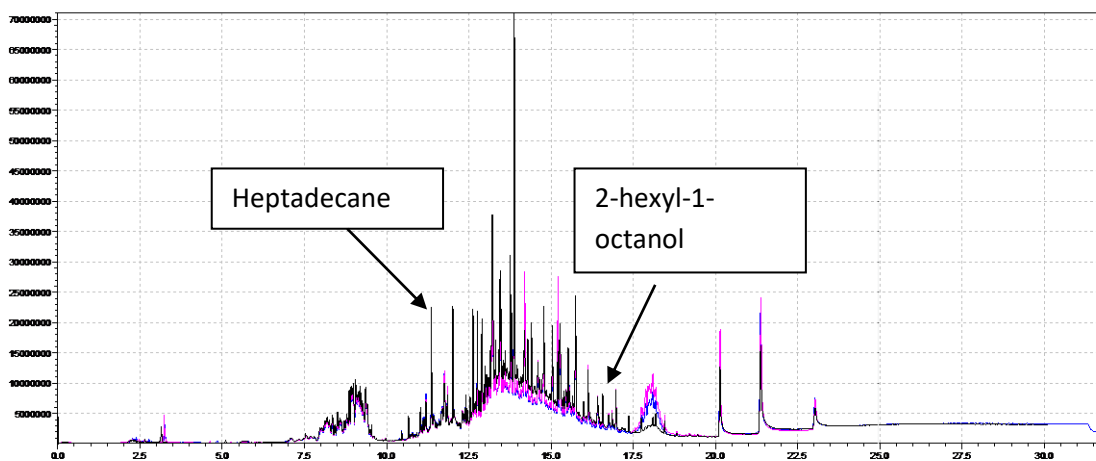
Ramp rate (°C/min)	Temperature (°C)	Hold time (min)
	40.0	4
20.0	325	15

MS:

Ion Source Temperature (°C)	200 °C
Transfer line Temperature (°C)	250 °C
Detector Voltage:	Use tune file
Solvent Cut Time: (min)	0
Micro Scan Width	0
Threshold	0
Start time: (min)	0.0
End time: (min)	32.0
Acquisition mode:	Scan
Event time (sec)	0.1
Scan speed	1000
Start m/z	50
End m/z	1000

Results:

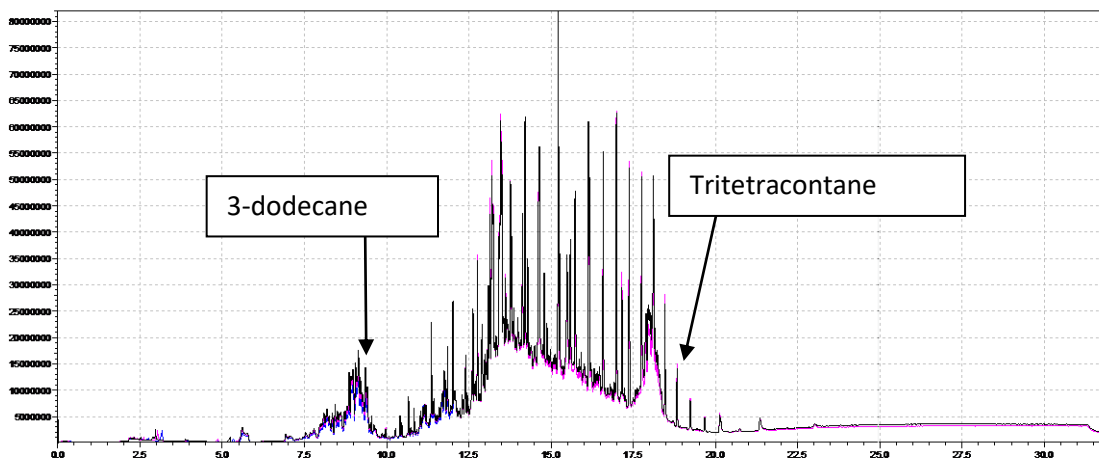
Sample: Paper 1



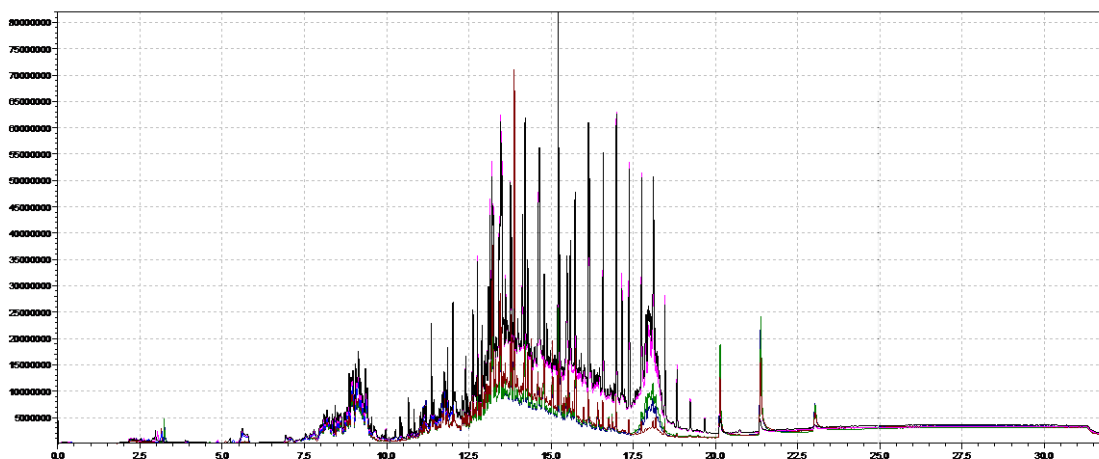
GL Sciences B.V.

De Sleutel 9, 5652 AS, Eindhoven, The Netherlands
Tel. +31 (0)40 254 95 31 E-mail: info@glsciences.eu
Internet: www.glsciences.eu

Sample: Paper 2



Overlapping comparison



Conclusions:

The fully automated thermal desorption of paper (for MOSH-MOAH) is very convenient to use. The sample preparation is simple. Cut the paper into pieces of 5 x 2 cm, and place them in the liner.