GL Sciences

Application note: 130

Pyrolysis of a PTFE

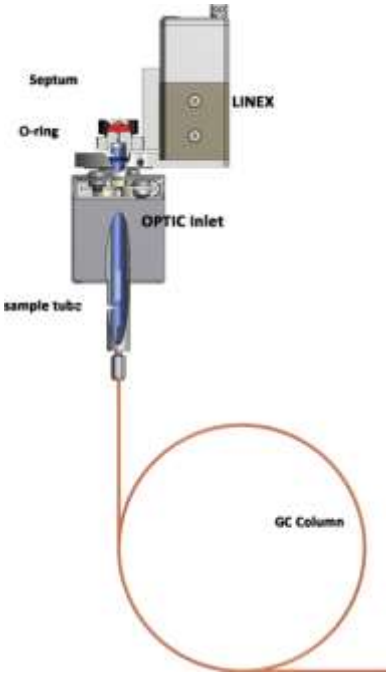
Keywords: Pyrolysis, OPTIC, LINEX,

Introduction

Building a database of Pyrograms for determination microplastics.
To get a good picture of the composition of microplastics, it is nessacery to obtain several pyrograms of different polymers to come to a method of detection, because every pyrolyser is different in heating speed and sample treatment

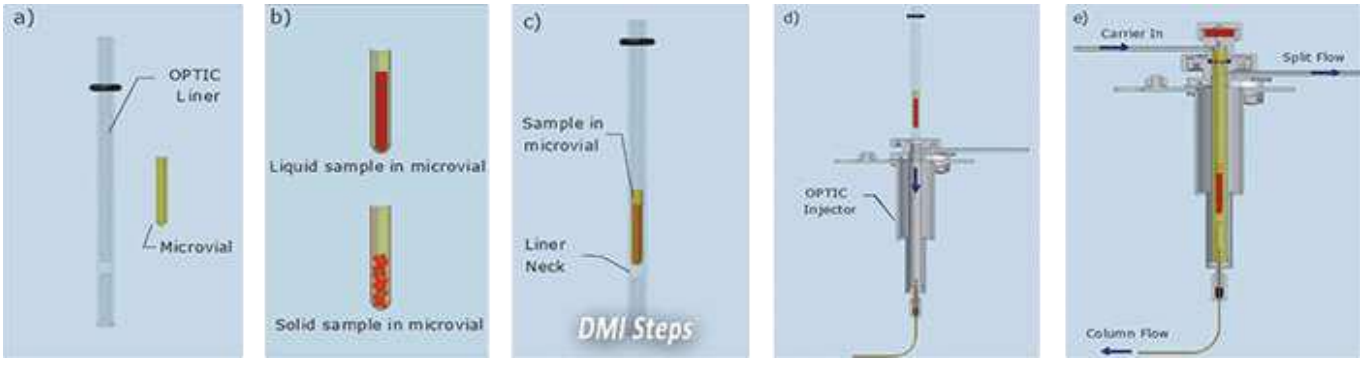
Analytical conditions:

Model GCMS:	GC-2030/MS-QP2020 NX, Shimadzu Corp.
GC Multimode Inlet:	OPTIC-4Pyro GC Inlet System, GL Sciences B.V.
Autosampler:	PAL3-RTC with LINEX Option, CTC Analytics AG
Column:	InertCap 5MS/Sil 0.25 mm x 30 m, 0.25 µm phase
Column Temperature:	40°C(5 min) –> 20°C/min –> 325°C
Injection mode:	Pyrolysis, Split Ratio 1:50
Sample:	Small piece of PTFE
Column flow:	1 mL/min
Inlet temperature program:	40°C → 60°C/sec → 700°C
Detector temperature:	200°C (ion chamber), 250°C (interface)
Liner:	Quartz liner with DMI insert



Workflow:

A small piece of polyamide was cut from a polyamide plate which was placed in a DMI vail.
The DMI vail was placed in the Quartz liner. The Quartz liner is taken from its rack position and transferred to the inlet. The Inlet is equipped with LINEX, which includes an automated head which can be opened or closed to accommodate the liner which is next to be analyzed.



Results:

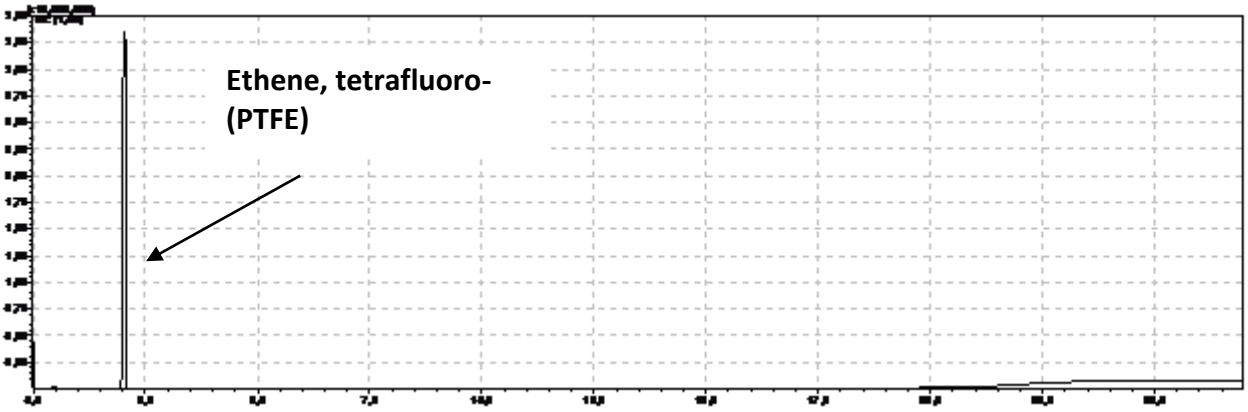


Figure 1. TIC chromatogram of Pyrolysis of Polyamide.

Conclusions:

As shown from the chromatogram, It is very easy to use OPTIC-4 for pyrolysis applications. For automation the LINEX and a CTC PAL3 can be used.
The sample handling is very easy, just place a small piece of sample into a microvial. This microvial is place into the OPTIC-4 liner.

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