

Report ref.	REPGET22-008	Center of analysis	Biodesiv 25 rue Becquerel 67200 Strasbourg FRANCE
Date of publication	15.07.22		
Category	External		
Subject	<b>Performance assessment: Getxent tubes, 100% parent odor fidelity</b>		

### Background

The purpose of this paper is to evaluate the ability of the Getxent tubes to impregnate and release each molecule from Camel<sup>®</sup> tobacco.

### Identification of samples

- 1 sample of pure Camel<sup>®</sup> tobacco
- 1 Getxent tube impregnated with Camel<sup>®</sup> tobacco odor

### Sample preparation

Pure tobacco has been put in a 20 mL glass vial at a concentration of 0,05g/mL and directly analyzed.

One Getxent tube has been impregnated 10 days in a glass jar of 106 mL containing the same concentration of Camel<sup>®</sup> tobacco (0,05g/mL). A wire has been used to suspend the Getxent tube in the jar.

After impregnation, the Getxent tube has been transferred in a 20 mL glass vial and stored for 24h at 30°C before analysis.

### Analysis - Procedure

The impregnated Getxent tube has been analyzed with internal method "Tube40RD v1" (see Annex 1)

The sample of pure tobacco has been analyzed with internal method "Tube30RD v2" (see Annex 2)

Only peaks integrated by the software are considered.

### Analysis - Machine

Brand: Scion

Model: 436-GC, single quadrupole, injector split/splitless

Accessories:

- SPME
- Incubator
- Combi-PAL
- Column: DB-WAX 60m, 0.25mm, 0.25µm (Agilent)
- SPME fiber: DVB/CAR/PDMS 2cm (Sigma-Aldrich 57299-U)



### Analysis - Consumables

Gas: 6.0 quality Helium filtered over an Oxygen, Moisture & Hydrocarbon Trap (Restek, RE21982).

Vials:

- Body: clear glass
- Cap: magnetic metal cap with hole + septum PTFE/Silicone
- Volume: 20ml
- Closure diameter: ND18
- Height: 75mm

Results

Chromatogram of pure Camel® tobacco

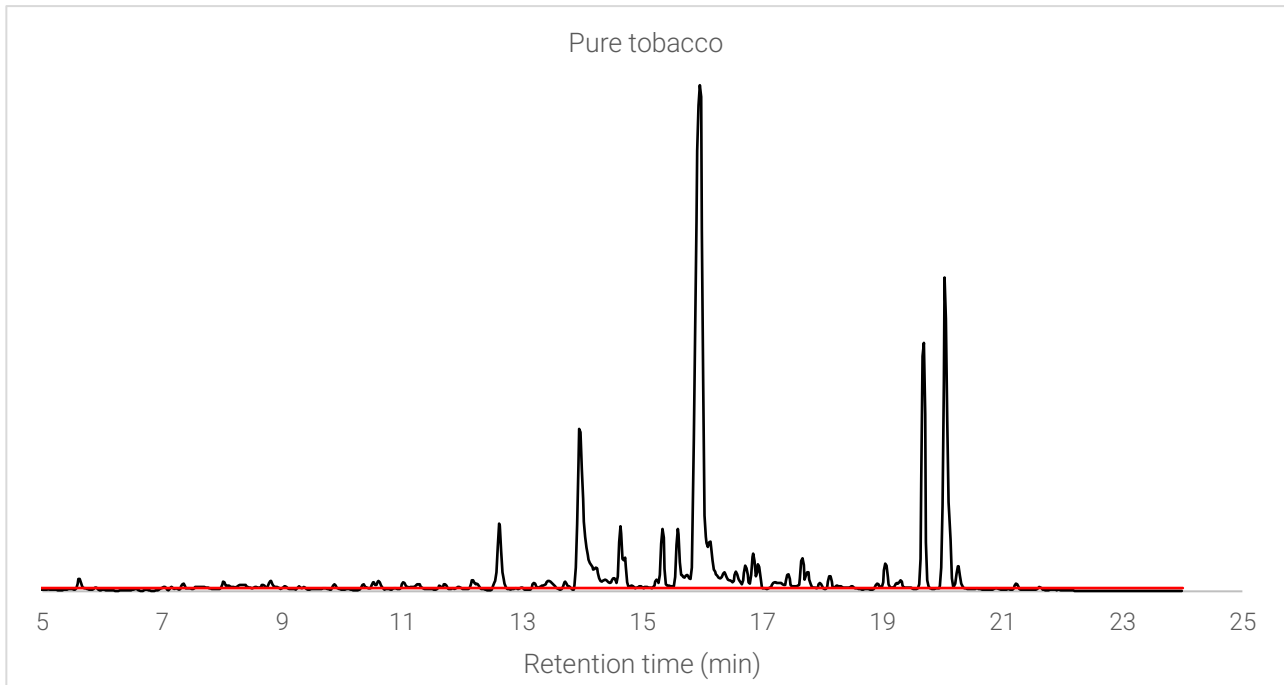


Figure 1: chromatogram of pure Camel® tobacco

The chromatogram of pure tobacco exhibits 80 peaks above the red line, which corresponds to the sensitivity threshold of the GC-MS equipment.

Chromatogram of Getxent Tube impregnated with Camel® tobacco

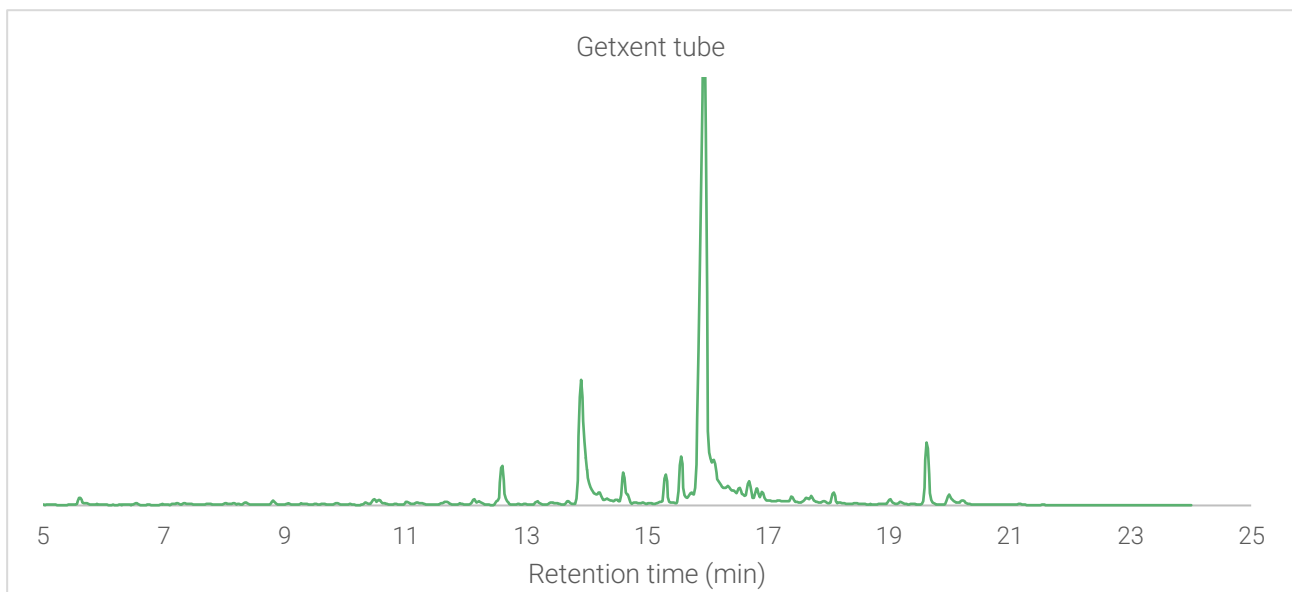


Figure 2: chromatogram of Getxent tube impregnated with Camel® tobacco

On the same criteria of integration limit, the same 80 peaks have also been counted on the chromatogram of the Getxent tube impregnated with Camel® tobacco.

Conclusion

The analysis of pure Camel® tobacco and Getxent tube impregnated with the same target odor (Camel® tobacco) have shown the same amount of peaks on each chromatogram.

The 80 molecules from Camel® tobacco and detected by the GC-MS have been detected by the Getxent tube impregnated by the same amount of target odor.

The Getxent tube is thus able to catch and release 100% parent odor.

Author	Reviewer
M. Combes Project Leader 15.07.22	G. Herin CEO 15.07.22

## Annex 1: Tube40RD V1 SPME-GC-MS method

```

*****
MSWS 8.0.1 for SCION - Method Listing   Fri Jul 15 16:21:02 2022

Method: Tube40RD v1.mth
*****
*****

*****
  CombiPAL AutoSampler
*****
Module Address: 24

CPAL Method:

          Injection Mode: GC SPME
          Read Bar Codes: Never
          Required Syringe: SPME Fiber
          Agitator Temperature: 40.0 C
Sample Pre-Incubation Time: 5 min. 0 sec.
Pre-Incubation Agitator Speed: 250 rpm
Pre-Incubation Agitation Cycle: 2 sec On, 4 sec Off.
  Extraction Agitator Speed: 250 rpm
    Fiber Depth From Bottom: 10 mm
      Extraction Time: 25 min. 0 sec.
        Injector: Front
          Desorb Time: 2 min. 0 sec.
            Use Bakeout Station: Yes
              Fiber Bakeout Time: 5 min. 0 sec.
                Fiber Clean Temperature: 225.0 C
                  GC Cycle Time (for Prep Ahead): 36 min. 0 sec.

*****
  SCION Mass Spec
*****
Module Address: 40

Acquisition Method =====

Acquisition delay 2.50 min.
No pre run macro.
No post run macro.
CID Gas off
Ion Source: EI
Data Type: Centroid

*****
  43X-GC - Model 436-GC
*****
Module Address: 44

Valve Table
-----
  No Valves Used

Front Injector Type S/SL
-----
  Oven Power: On
  Coolant: Off
  Enable Coolant at: 250.0 C
  Coolant Timeout: 20.00 min

  Temp   Rate   Hold   Total
  (C)   (C/min) (min)  (min)
-----
  250.0   0.0   20.00  20.00

  Time   Split   Split
  (min)  State   Ratio
-----
  Initial  On      10
  0.01    Off     Off
  2.00    On      50

Front Injector EFC Type 21: Enabled
-----
  Constant Column Flow: 1.00 ml/min
  Pressure Pulse: none

  No Backflush.

Column Oven
-----
  Coolant: Off
  Enable Coolant at: 50.0 C
  Coolant Timeout: 20.00 min
  Stabilization Time: 2.00 min
  
```

Temp (C)	Rate (C/min)	Hold (min)	Total (min)
40.0	0.0	1.00	1.00
200.0	10.0	5.00	22.00

No Auxiliary Heaters installed

Data Acquisition

-----  
Acquisition Frequency : 25.0 Hz  
Monitor Length : 64 points (2.560 sec)  
Front FID/NPD Scale: 10 Volts  
Middle FID/NPD Scale: 10 Volts  
Rear FID/NPD Scale: 10 Volts

## Annex 2 : Tube 30RD V2 SPME-GC-MS method

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*****
MSWS 8.0.1 for SCION - Method Listing   Fri Jul 15 16:21:29 2022

Method: Tube30RD v2.mth
*****
*****

CombiPAL AutoSampler
*****
Module Address: 24

CPAL Method:

                Injection Mode: GC SPME
                Read Bar Codes: Never
                Required Syringe: SPME Fiber
                Agitator Temperature: 30.0 C
                Sample Pre-Incubation Time: 5 min. 0 sec.
                Pre-Incubation Agitator Speed: 250 rpm
                Pre-Incubation Agitation Cycle: 2 sec On, 4 sec Off.
                Extraction Agitator Speed: 250 rpm
                Fiber Depth From Bottom: 10 mm
                Extraction Time: 25 min. 0 sec.
                Injector: Front
                Desorb Time: 2 min. 0 sec.
                Use Bakeout Station: Yes
                Fiber Bakeout Time: 5 min. 0 sec.
                Fiber Clean Temperature: 225.0 C
                GC Cycle Time (for Prep Ahead): 36 min. 0 sec.

*****
                SCION Mass Spec
                *****
Module Address: 40

Acquisition Method =====

Acquisition delay 2.50 min.
No pre run macro.
No post run macro.
CID Gas off
Ion Source: EI
Data Type: Centroid

*****
                43X-GC - Model 436-GC
                *****
Module Address: 44

Valve Table
-----
                No Valves Used

Front Injector Type S/SL
-----
                Oven Power: On
                Coolant: Off
                Enable Coolant at: 250.0 C
                Coolant Timeout: 20.00 min

                Temp      Rate      Hold      Total
                (C)      (C/min)  (min)     (min)
                -----
                250.0      0.0      20.00     20.00

                Time      Split      Split
                (min)     State     Ratio
                -----
                Initial    On        10
                0.01      Off       Off
                2.00      On        50

Front Injector EFC Type 21: Enabled
-----
                Constant Column Flow: 1.00 ml/min
                Pressure Pulse: none

                No Backflush.

Column Oven
-----
                Coolant: Off
                Enable Coolant at: 50.0 C
                Coolant Timeout: 20.00 min
                Stabilization Time: 2.00 min
  
```

Temp (C)	Rate (C/min)	Hold (min)	Total (min)
40.0	0.0	1.00	1.00
200.0	10.0	5.00	22.00

No Auxiliary Heaters installed

Data Acquisition

-----  
Acquisition Frequency : 25.0 Hz  
Monitor Length : 64 points (2.560 sec)  
Front FID/NPD Scale: 10 Volts  
Middle FID/NPD Scale: 10 Volts  
Rear FID/NPD Scale: 10 Volts