



Certificate of Analysis

ISO 9001

Reference Material

Product name

L-Camphor

Product code

MM3327.01

CAS number

464-48-2

Molecular weight

152.23

Molecular formula

C₁₀H₁₆O

Lot number

1030363

Appearance

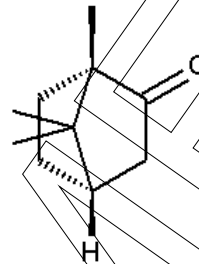
white solid

Melting point

177 °C

Long-term storage

2 to 8 °C, dark



Assay "as is"
99.8 %

Date of shipment:

04 Nov 2019

Producer confirms that this reference material (RM) meets the specification detailed on this Certificate of Analysis for **one year** from the date of shipment, provided the substance is stored under the recommended conditions unopened in the original container.

Release by:	Date of Release:		Product Release
Dr. Sabine Schröder	Luckenwalde, 07 Oct 2019		



Mikromol™

Product information

For laboratory use only. Not suitable for human or animal consumption.

Before usage of the RM, it should be allowed to warm to room temperature. No drying required, as the certified value is already corrected for the content of water and other volatile materials.

The product quality is controlled by regularly performed quality control tests (retests).

Further content

Identity

Assay

Final result

Revision table

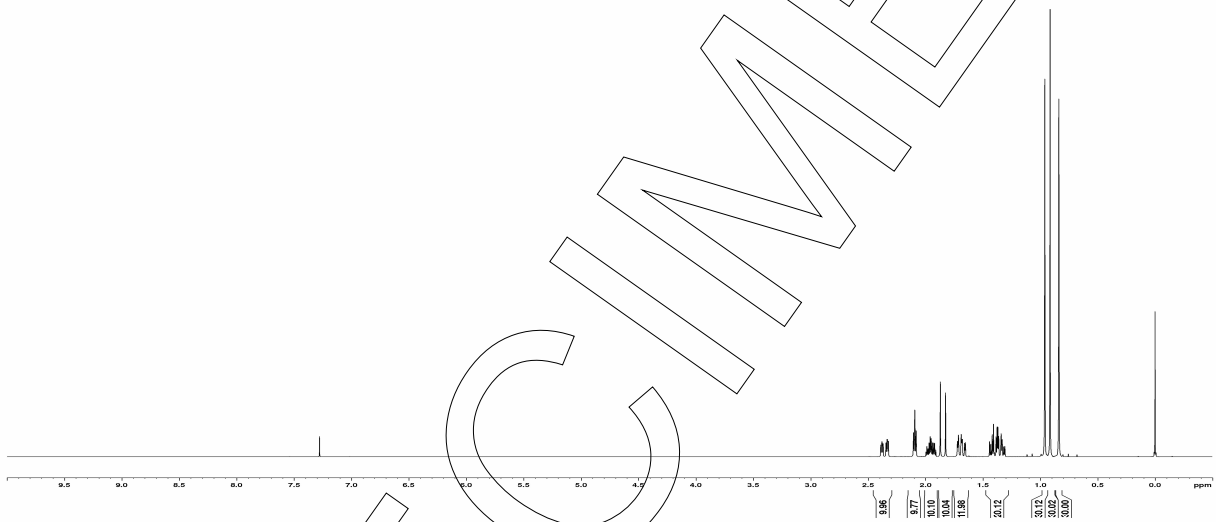
SPECIMEN



Identity

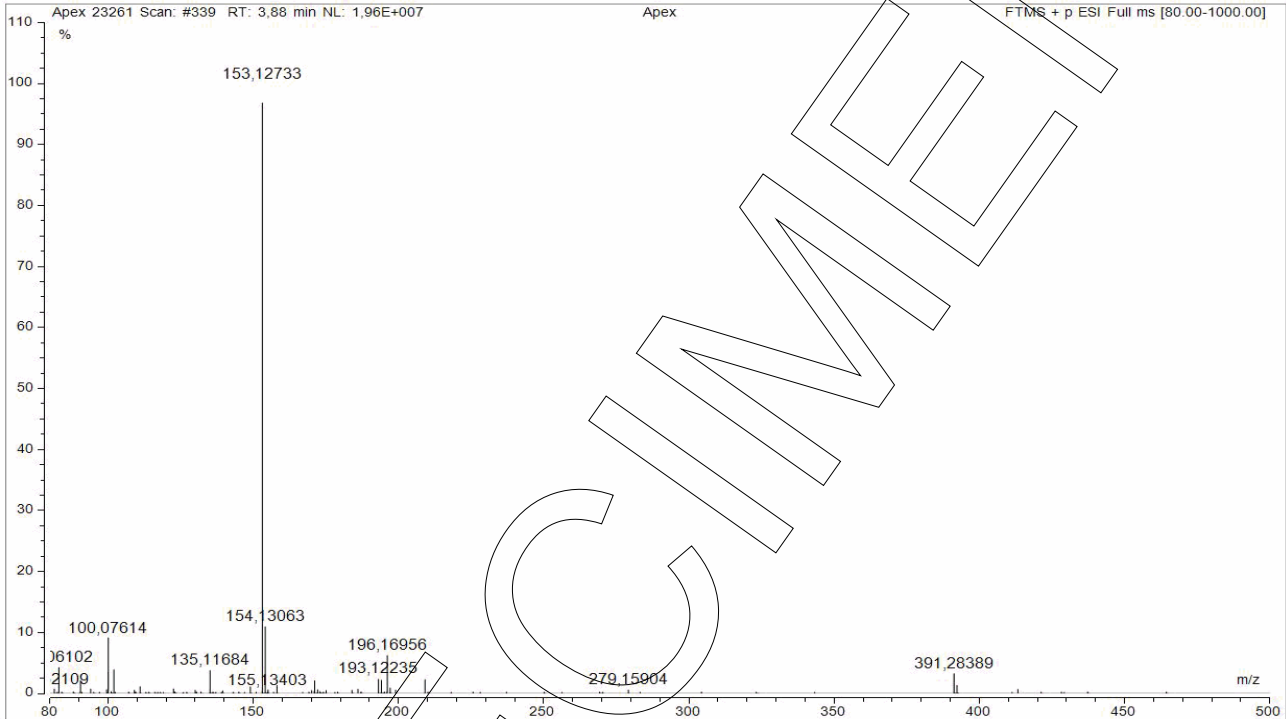
The identity of the reference material was established by following analyses.

Method	Conditions	Result
¹ H-NMR	400 MHz, CDCl ₃	Structure confirmed





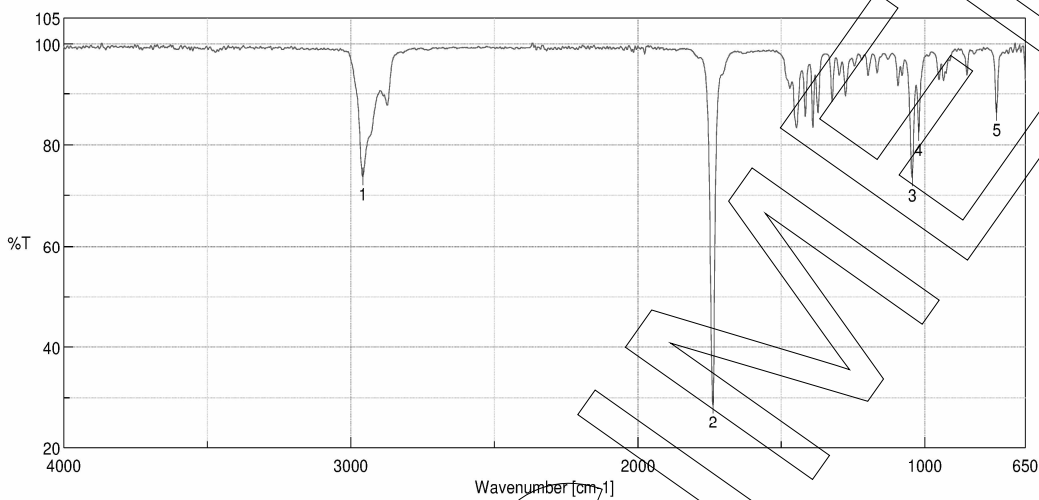
Method	Conditions	Result
MS	3.5 kV ESI+; capillary temperature: 269 °C Theoretical value: 153.12739	Structure confirmed



SPEICIMES



Method	Conditions	Result
IR	Attenuated Total Reflection Fourier Transform Infrared (ATR-FTIR) Spectroscopy	Structure confirmed



No.	Position	Intensity
1	2958.27	73.5675
2	1738.51	28.5845
3	1044.26	73.3797
4	1021.12	82.4163
5	750.174	86.3211

Assay

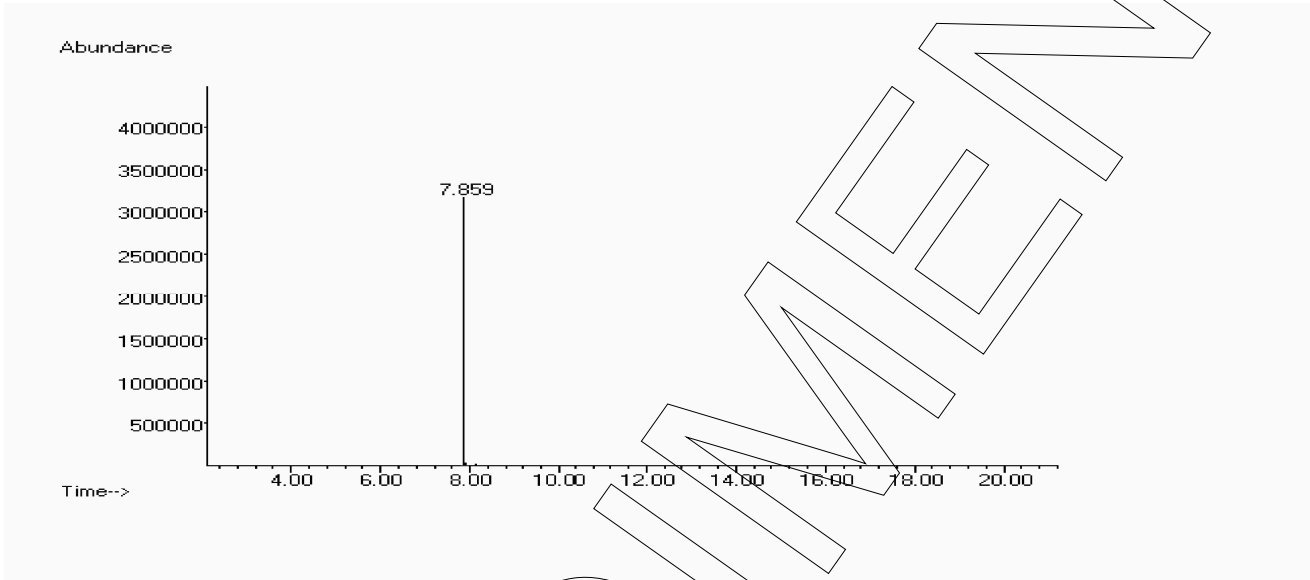
The assay of the reference material was assessed by following analyses.

Purity by Gas Chromatography (GC)

GC Conditions:	
Column	HP-5MS 30 m x 0.25 mm x 0.25 µm
Detector	EI, 70 eV; 35 to 550 amu; 280 °C
Injector	Split 20:1, 220 °C
Flow rate	Helium 1.50 ml/min
Oven program	Initial Temp.: 50 °C for 5 min Heating Rate: 40 °C/min Final Temp.: 300 °C for 10 min



GC chromatogram and peak table



Area percent report - sorted by signal				
Pk #	Retention time	Area	Area %	
1	7.859	24177205	100.00	
Totals		24177205	100.00	

The content of the analyte was determined as ratio of the peak area of the analyte and the cumulative areas of the purities, added up to 100 %. Air peaks were ignored in calculation.

Result (n = 3)	100.00 %; SD < 0.01 %
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Volatile content

Water content	
Method	Karl Fischer titration
Result (n = 3)	0.22 %; SD < 0.01 %



Residual solvents

Method

¹H-NMR

Result (n = 1)

No significant amounts of residual solvents were detected (< 0.05 %).

Final result

Assay "as is": 99.78 %

The assay "as is" is assessed by 100% method (mass balance) and is equivalent to the assay based on the not anhydrous and not dried substance respectively.

The calculation of the 100% method follows the formula:

$$\text{Assay (\%)} = (100 \% - \text{volatile contents (\%)}) * \frac{\text{Purity (\%)}}{100 \%}$$

Volatile contents are considered as absolute contributions and purity is considered as relative contribution. Inorganic residues are excluded by additional tests.

Revision table

Revision	Date	Reason for revision
00	07 Oct 2019	Release of the Certificate of Analysis - initial version

Product warranties for the RM are set out in the terms and conditions of purchase.