CERTIFICATE OF ANALYSIS – GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 22E31-PTH02
Customer identification : Orange Blood ORGANIC - Italy - OH0103R
Type : Essential oil
Source : *Citrus sinensis* cv. Sanguinelli
Customer : Plant Therapy

ANALYSIS

Method: PC-MAT-014 ✱ISO - Analysis of the composition of an essential oil or other volatile liquid by FAST GC-FID (in French); identifications validated by GC-MS.
Analyst : Seydou Ka, Ph. D.
Analysis date : June 01, 2022

Checked and approved by :

_____
Alexis St-Gelais, Ph. D., Chimiste 2013-174

Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia. This report is digitally signed, it is only considered valid if the digital signature is intact. The results only describe the samples that were submitted to the assays.

✱ISO 17025:2017
MÉTHODE CERTIFIÉE
CERTIFIED METHOD

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PHYSICOCHEMICAL DATA

Physical aspect: Orange liquid
Refractive index: 1.4736 ± 0.0003 (20 °C; method PC-MAT-016)

CONCLUSION

No adulterant, contaminant or diluent has been detected using this method.

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ANALYSIS SUMMARY – CONSOLIDATED CONTENTS

New readers of similar reports are encouraged to read table footnotes at least once.

Identification	%	Class
α-Thujene	tr	Monoterpene
α-Pinene	0.56	Monoterpene
Camphene	tr	Monoterpene
Sabinene	0.17	Monoterpene
β-Pinene	0.02	Monoterpene
Myrcene	1.97	Monoterpene
α-Phellandrene	tr	Monoterpene
Octanal	0.27	Aliphatic aldehyde
Pseudolimonene	0.04	Monoterpene
Δ3-Carene	0.10	Monoterpene
Limonene	94.24	Monoterpene
β-Phellandrene	0.28	Monoterpene
(Z)-β-Ocimene	0.01	Monoterpene
(E)-β-Ocimene	0.02	Monoterpene
cis-Sabinene hydrate	0.01	Monoterpenic alcohol
Octanol	0.03	Aliphatic alcohol
Terpinolene	0.02	Monoterpene
Linalool	0.34	Monoterpenic alcohol
Nonanal	0.03	Aliphatic aldehyde
cis-para-Mentha-2,8-dien-1-ol	tr	Monoterpenic alcohol
Citronellal	0.04	Monoterpenic aldehyde
α-Terpineol	0.05	Monoterpenic alcohol
Decanal	0.27	Aliphatic aldehyde
Nerol	0.01	Monoterpenic alcohol
Neral	0.03	Monoterpenic aldehyde
Geranial	0.05	Monoterpenic aldehyde
Limonen-10-ol	0.01	Monoterpenic alcohol
Undecanal	0.01	Aliphatic aldehyde
α-Copaene	0.02	Sesquiterpene
Geranyl acetate	0.02	Monoterpenic ester
β-Elemene	0.01	Sesquiterpene
Dodecanal	0.06	Aliphatic aldehyde
β-Caryophyllene	0.08	Sesquiterpene
β-Copaene	0.03	Sesquiterpene
α-Humulene	0.02	Sesquiterpene
(E)-β-Farnesene	0.01	Sesquiterpene
Germacrene D	0.03	Sesquiterpene
Valencene	0.14	Sesquiterpene
Bicyclogermacrene	0.02	Sesquiterpene
α-Muurolene	0.01	Sesquiterpene
γ-Cadinene	0.04	Sesquiterpene
δ-Cadinene	0.04	Sesquiterpene
Caryophyllene oxide	0.02	Sesquiterpenic ether
β-Sinensal	0.02	Sesquiterpenic aldehyde
α-Sinensal	0.01	Sesquiterpenic aldehyde

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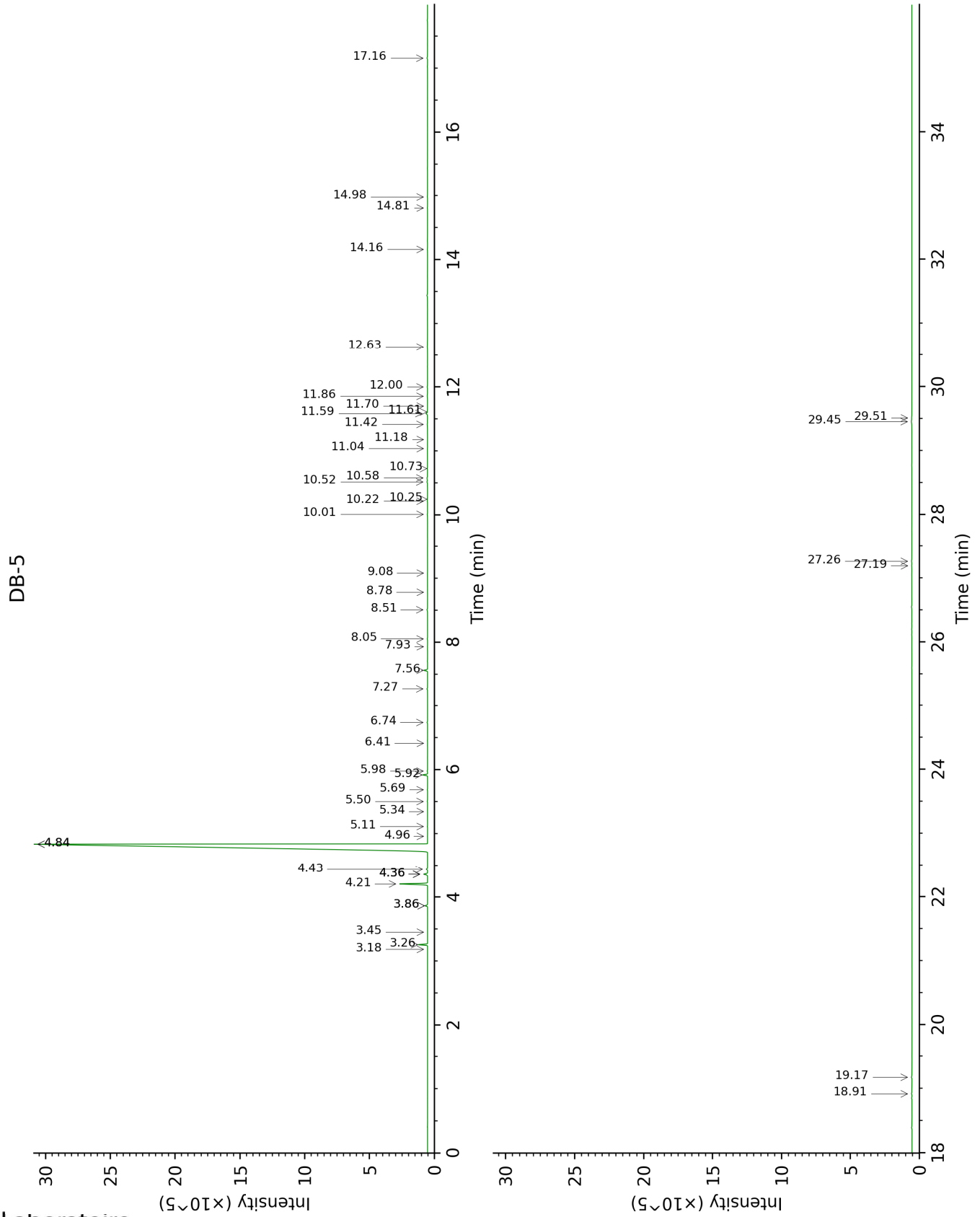|		
Myristic acid	0.02	Aliphatic acid
Palmitic acid	0.06	Aliphatic acid
Linoleic acid	0.04	Aliphatic acid
Stearic acid	0.06	Aliphatic acid
Tetramethoxyflavone isomer	0.02	Flavonoid
Tangeretin	0.04	Flavonoid
3,3',4',5,6,7,8-Heptamethoxyflavone	0.08	Flavonoid
Nobiletin	0.03	Flavonoid
Consolidated total	**99.51%**	

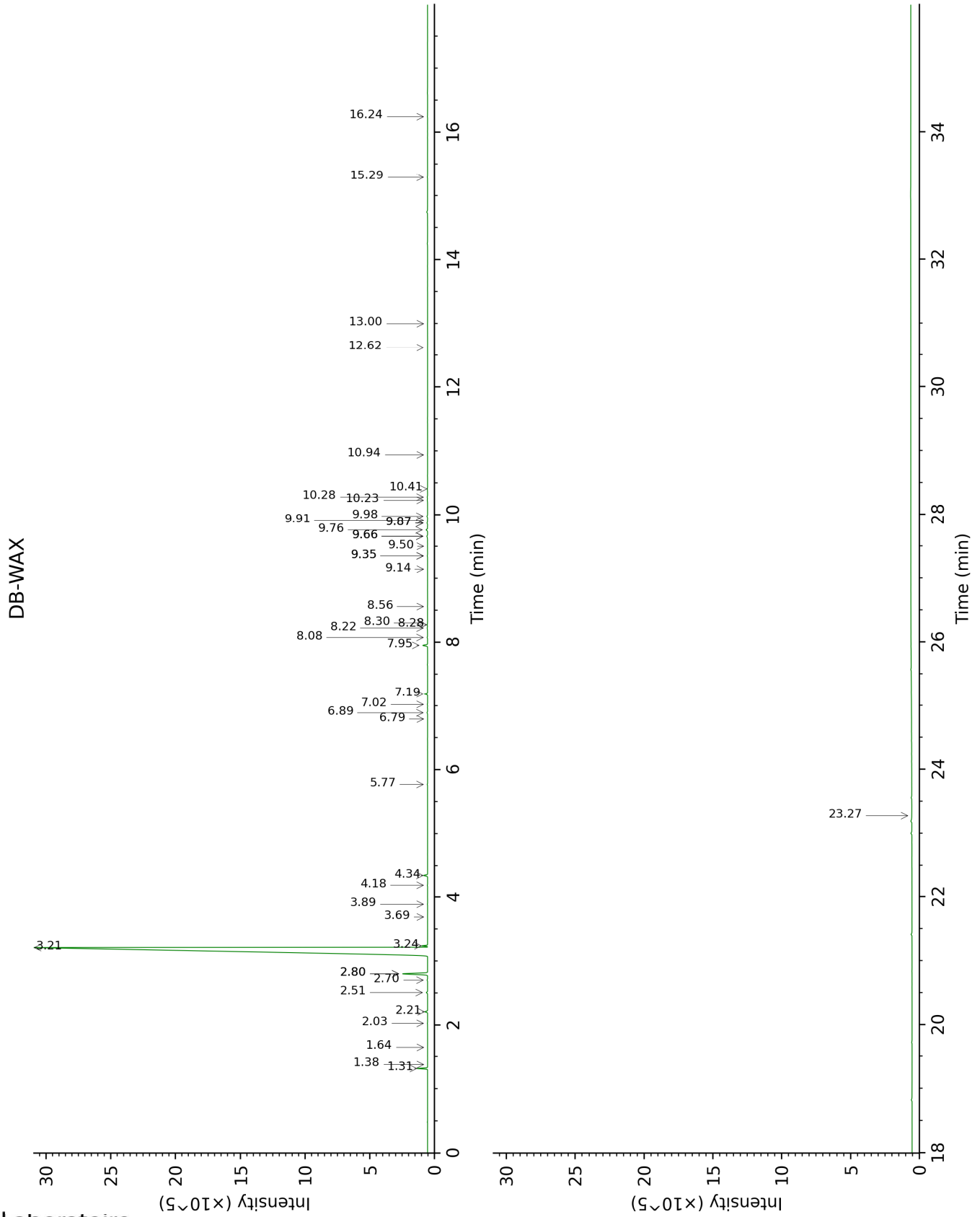tr: The compound has been detected below 0.005% of total signal.

Note: no correction factor was applied

About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm is set to prioritize data from the most standard DB-5 column, and smallest values so as to avoid overestimating individual content. This process is semi-automatic. Advanced users are invited to consult the "Full analysis data" table after the chromatograms in this report to access the full untreated data and perform their own calculations if needed.

Unknowns: Unknown compounds' mass spectral data is presented in the "Full analysis data" table. The occurrence of unknown compounds is to be expected in many samples, and does not denote particular problems unless noted otherwise in the conclusion.

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DB-5

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DB-WAX

16.24
15.29
13.00
12.62
10.94
10.41
10.28
10.23
9.91
9.98
9.87
9.76
9.66
9.35
9.50
9.14
8.56
8.30
8.28
8.22
8.08
7.95
7.19
7.02
6.89
6.79
5.77
4.34
4.18
3.89
3.69
3.24
3.21
2.80
2.70
2.51
2.21
2.03
1.64
1.38
1.31

23.27

Time (min)

Intensity (×10^5)

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FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
α-Thujene	3.18	926	tr	1.38	1001	tr
α-Pinene	3.26	930	0.56	1.31	992	0.56
Camphene	3.45	943	tr	1.64	1028	tr
Sabinene	3.86*	970	0.19	2.21	1084	0.17
β-Pinene	3.86*	970	[0.19]	2.03	1066	0.02
Myrcene	4.20	993	1.97	2.80*	1135	1.98
α-Phellandrene	4.36*	1003	0.31	2.80*	1135	[1.98]
Octanal	4.36*	1003	[0.31]	4.34	1253	0.27
Pseudolimonene	4.36*	1003	[0.31]	2.70	1127	0.04
Δ3-Carene	4.44	1008	0.10	2.51	1112	0.09
Limonene	4.84*	1033	94.43	3.21	1167	94.24
β-Phellandrene	4.84*	1033	[94.43]	3.24	1169	0.28
(Z)-β-Ocimene	4.96	1040	0.01	3.69	1205	0.01
(E)-β-Ocimene	5.11	1050	0.02	3.89	1220	0.02
cis-Sabinene hydrate	5.34	1065	0.01	6.79	1430	tr
Octanol	5.50	1075	0.03	8.08	1527	0.02
Terpinolene	5.69	1086	0.02	4.18	1241	0.02
Linalool	5.92	1101	0.34	7.95	1517	0.34
Nonanal	5.98	1105	0.03	5.77	1355	0.03
cis-para-Mentha-2,8-dien-1-ol	6.41	1133	tr	9.35*	1628	0.02
Citronellal	6.74	1154	0.04	6.89	1437	0.04
α-Terpineol	7.27	1188	0.05	9.66*	1653	0.07
Decanal	7.56	1207	0.27	7.19	1460	0.27
Nerol	7.93	1232	0.01	10.94	1760	0.01
Neral	8.05	1241	0.03	9.35*	1628	[0.02]
Geranial	8.51	1272	0.05	9.98	1679	0.05
Limonen-10-ol	8.78	1290	0.01	13.00	1943	0.01
Undecanal	9.08	1307	0.01	8.56	1565	0.01
α-Copaene	10.01	1372	0.02	7.02	1447	0.02
Geranyl acetate	10.22	1387	0.02	10.41	1714	0.02
β-Elemene	10.25	1389	0.01	8.30	1545	0.01
Dodecanal	10.52	1408	0.06	9.87*	1670	0.05
β-Caryophyllene	10.58	1413	0.08	8.28	1542	0.02
β-Copaene	10.73	1424	0.03	8.22	1538	0.02
α-Humulene	11.04	1447	0.02	9.14	1610	0.01
(E)-β-Farnesene	11.18	1458	0.01	9.50	1640	tr
Germacrene D	11.42	1475	0.03	9.66*	1653	[0.07]
Valencene	11.58	1488	0.14	9.76	1661	0.12
Bicyclogermacrene	11.61	1490	0.02	9.87*	1670	[0.05]
α-Muurolene	11.70	1496	0.01	9.92	1674	0.01
γ-Cadinene	11.86	1508	0.04	10.23	1699	0.04
δ-Cadinene	12.00	1520	0.04	10.28	1703	0.04
Caryophyllene oxide	12.63	1569	0.02	12.62	1908	0.01
β-Sinensal	14.16	1694	0.02	15.29	2165	0.02
α-Sinensal	14.81	1750	0.01	16.24	2263	0.01
Myristic acid	14.98	1765	0.02			
Palmitic acid	17.16	1964	0.06			

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	R.T.	R.I.	%	R.T.	R.I.	%
Linoleic acid	18.91	2138	0.04			
Stearic acid	19.17	2164	0.06	23.28	3113	0.01
Tetramethoxyflavone isomer	27.19	3133	0.02			
Tangeretin	27.26	3140	0.04			
3,3',4',5,6,7,8-Heptamethoxyflavone	29.45	3324	0.08			
Nobiletin	29.51	3328	0.03			
Total identified		**99.42%**			**98.98%**	
Total reported		**99.42%**			**98.98%**	

*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, not taken into account in the consolidated total

tr: The compound has been detected below 0.005% of total signal.

Note: no correction factor was applied
R.T.: Retention time (minutes)
R.I.: Retention index

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