
Analytical Report	
Title	**Peppermint Supreme** Essential Oil Profile by GC-MS
Report No.	SE-37270-24
Issue Date	August 31, 2015
Notebook reference	III-29-75
Contributors:	
Quote No.	
Requester	Blue World Naturals LLC

Primary Aim

To identify GC amendable volatile organic compounds present in submitted **Cardamom** essential oil sample.

Samples

The sample arrived as clear liquid with characteristic odor labeled as "Peppermint Supreme lot 11114-e32".

Experimental:

1. Oil was dissolved in methanol to concentration of ~0.1%, 1 ul injected into the GC injector port.

2. GC conditions:

Injector temperature:	250 C
Initial oven temperature:	80 C
Ramp	10 C/min
Final temperature	220 C
Final temperature hold	5 min

3. MS parameters

Ionization and ion polarity	EI+
Scan rate	2 scans/sec
Mass range	35-350 Da
Ion source temperature	150C
Transfer line temperature	280C

4. GC-MS analysis. Waters/Micromass Quatro GC mass spectrometer interfaced to a ThermoElectron Trace gas chromatograph was utilized for the analysis. 30m 0.25 mm ID DB-5 column was used to separate components. Carrier gas was helium at 1.1 ml/min with split ratio of 50.

5. Data treatment.
For each sample, a set of target components was identified with the aid of the AMDIS software[1].The components were identified using the NIST mass spectral library[2].

Deliverables

1. GC-MS chromatogram. GC-MS chromatogram is shown in Appendix I.

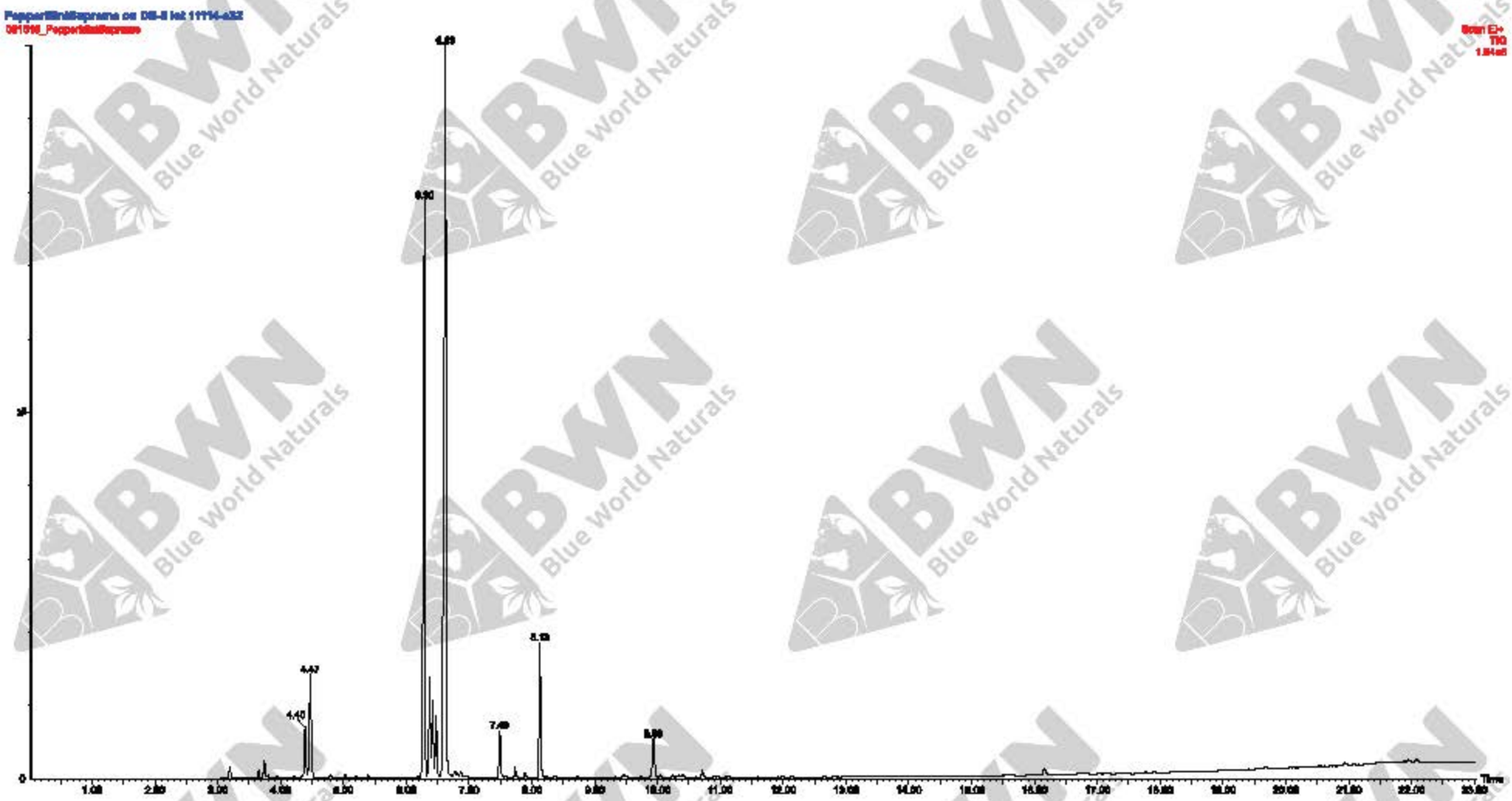
2. Appendix II lists library search results.

- RT Retention Time, time in minutes at which the compound elutes out of column
- CAS. CAS registry number or EPA number.
- Name. IUPAC or common name of identified compound.
- Area. Peak area of a component in %% to total ion count

1 http://chemdata.nist.gov/mass-spc/amdis/
2 http://www.nist.gov/srd/nistla.cfm

APPENDIX I
Peppermint Supreme
GC-MS Chromatogram

Sample “Peppermint Supreme”



APPENDIX II
Peppermint Supreme
Identified Compounds

Peppermint Supreme

CAS	Name	R.T.	Area
80-56-8	alpha-pinene	3.174	0.5
79925	Camphene	3.389	0.0
591242	Cyclohexanone, 3-methyl-	3.465	0.0
3387415	Bicyclo[3.1.0]hexane, 4-methylene-1-(1-methylethyl)-	3.634	0.3
127913	beta-Pinene	3.727	0.8
123353	ß-Myrcene	3.782	0.1
589980	3-Octanol	3.916	0.1
99865	1,3-Cyclohexadiene, 1-methyl-4-(1-methylethyl)-	4.207	0.1
527844	Benzene, 1-methyl-2-(1-methylethyl)-	4.318	0.1
138863	Limonene	4.376	2.2
470826	Eucalyptol	4.454	5.7
99854	1,4-Cyclohexadiene, 1-methyl-4-(1-methylethyl)-	4.776	0.1
15537550	Bicyclo[3.1.0]hexan-2-ol, 2-methyl-5-(1-methylethyl)-, (1α,2ß,5α)-	5.008	0.1
554610	Bicyclo[4.1.0]hept-2-ene, 3,7,7-trimethyl-	5.178	0.0
78706	1,6-Octadien-3-ol, 3,7-dimethyl-	5.379	0.1
89792	Cyclohexanol, 5-methyl-2-(1-methylethenyl)-, [1R-(1α,2ß,5α)]-	6.165	0.1
10458147	Cyclohexanone, 5-methyl-2-(1-methylethyl)-	6.271	26.3
494906	Benzofuran, 4,5,6,7-tetrahydro-3,6-dimethyl-	6.355	3.6
89805	Cyclohexanone, 5-methyl-2-(1-methylethyl)-, trans-	6.403	2.4
21129271	Cyclohexanol, 1-methyl-4-(1-methylethyl)-	6.457	2.5
2216-51-5	Menthol	6.606	41.9
20126765	3-Cyclohexen-1-ol, 4-methyl-1-(1-methylethyl)-, (R)-	6.639	0.2
21129271	Cyclohexanol, 1-methyl-4-(1-methylethyl)-	6.753	0.2
2216515	Cyclohexanol, 5-methyl-2-(1-methylethyl)-, [1R-(1α,2ß,5α)]-	6.797	0.1
98555	3-Cyclohexene-1-methanol, α,α4-trimethyl-	6.85	0.2
89827	Pulegone	7.469	2.1
6485401	2-Cyclohexen-1-one, 2-methyl-5-(1-methylethenyl)-, (R)-	7.567	0.1
89816	2-Cyclohexen-1-one, 3-methyl-6-(1-methylethyl)-	7.716	0.4
2216515	Cyclohexanol, 5-methyl-2-(1-methylethyl)-, [1R-(1α,2ß,5α)]-	7.875	0.2
29066340	Menthyl acetate	8.109	5.8
74663835	1,5-Heptadiene, 2,5-dimethyl-3-methylene-	8.715	0.0
5208593	Cyclobuta[1,2:3,4]dicyclopentene, decahydro-3a-methyl-6-methylene-1-(1-methylethyl)-, [1S-(1	9.438	0.1
110823682	Cyclohexane, 1-ethenyl-1-methyl-2,4-bis(1-methylethenyl)-	9.479	0.1
118650	Bicyclo[7.2.0]undec-4-ene, 4,11,11-trimethyl-8-methylene-,[1R-(1R*,4Z,9S*)]-	9.917	2.2
23986745	1,6-Cyclodecadiene, 1-methyl-5-methylene-8-(1-methylethyl)-, [s-(E,E)]-	10.032	0.1
28973979	1,6,10-Dodecatriene, 7,11-dimethyl-3-methylene-, (Z)-	10.218	0.1

Peppermint Supreme

23986745	1,6-Cyclodecadiene, 1-methyl-5-methylene-8-(1-methylethyl)-, [s-(E,E)]-	10.318	0.1
502998	1,3,7-Octatriene, 3,7-dimethyl-	10.383	0.1
23986745	1,6-Cyclodecadiene, 1-methyl-5-methylene-8-(1-methylethyl)-, [s-(E,E)]-	10.695	0.3
74663835	1,5-Heptadiene, 2,5-dimethyl-3-methylene-	10.879	0.1
23986745	1,6-Cyclodecadiene, 1-methyl-5-methylene-8-(1-methylethyl)-, [s-(E,E)]-	10.938	0.1
483761	Naphthalene, 1,2,3,5,6,8a-hexahydro-4,7-dimethyl-1-(1-methylethyl)-, (1S-cis)-	11.114	0.1
629925	Nonadecane	16.139	0.4
7683649	Squalene	21.065	0.0
563166	Hexane, 3,3-dimethyl-	21.928	0.0
2801845	Decane, 2,4-dimethyl-	21.929	0.0
6138905	2,6-Octadiene, 1-bromo-3,7-dimethyl-, (E)-	22.061	0.0