

Customer :

**LEARNING ABOUT EOS
Lea HARRIS**

(address removed by Lea Harris)

Sample nature : ESSENTIAL OIL
Botanical name : MENTHA PIPERATA
Reference name : PEPPERMINT
Batch number : Nature's Gift USA
Origin : U.S.A
Part: LEAF
Pyrenessences reference : 8951

Date of reception : 13/09/2013 **Date analysis :** 27/09/2013
Packaging : Blue flask of 15 ml - ambient temperature
Wanted analysis : Classic analysis + Classification
Shelf life in our laboratory 1 an

Comments and Conclusions :

**⇒ BATCH IN COMPLIANCE WITH THE NORM OF MENTHA
PIPERATA US ESSENTIAL OIL: NF T 75-210 : 2008**

Report validated by :

Daniel Dantin



GAS CHROMATOGRAPHY (norm NF ISO 11024)

Conditions :

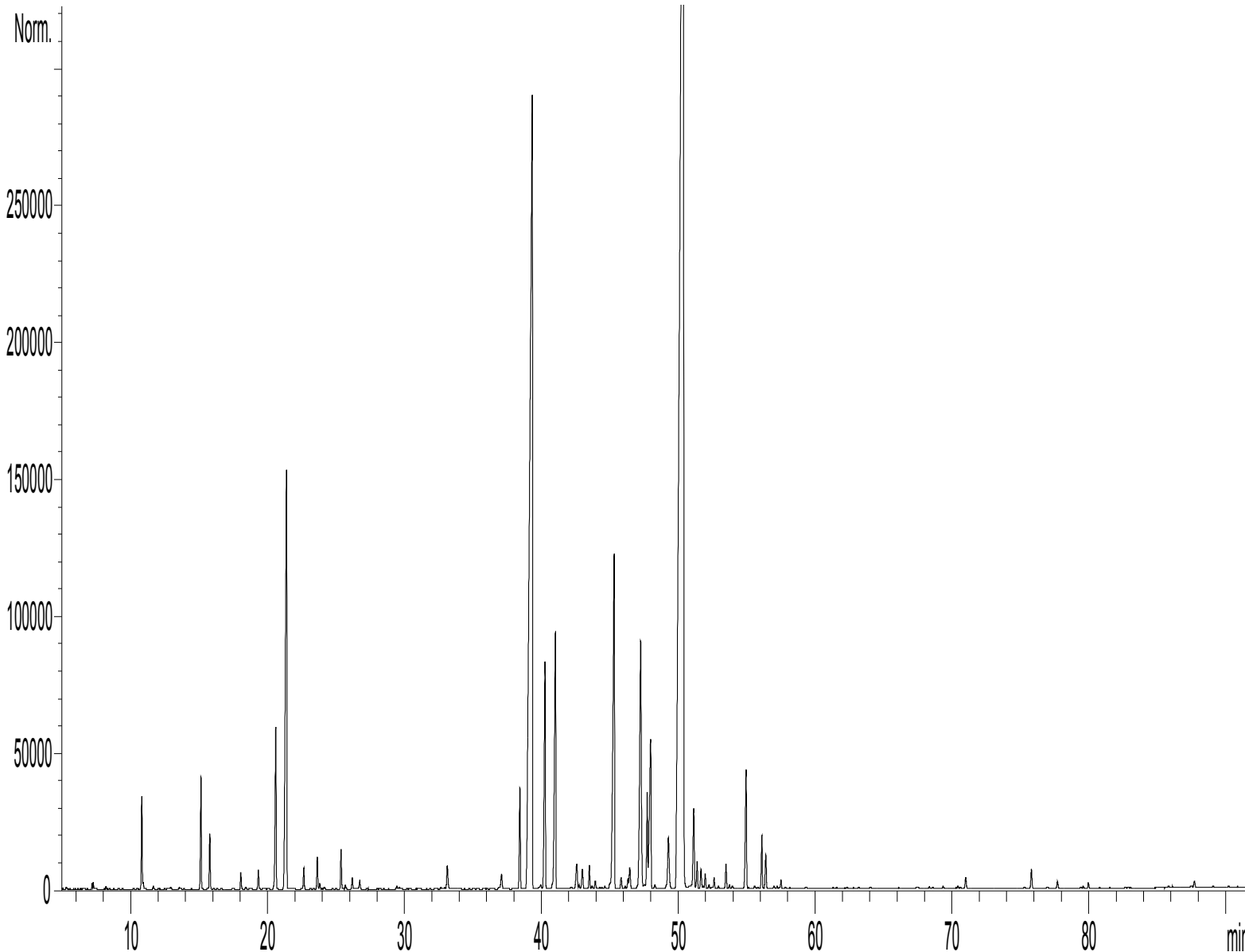
- CPG/SM and CPG/FID (GC : 5890 - SM : 5970 HEWLETT PACKARD)
- Column : HP INNOWAX polar : 60 m × 0,25 mm × 0,5 µm
- Programmation : 6 min to 60°C – 2°C/min → 250°C – 10 min to 250°C
- Carrier gas : He 30 psi/FID ; 23 psi/MS
- Dilution: 10 % in Hexane
- Mass : 30 à 350
- Sample injection : 1 µL

Mass range : 30 to 350, Oil components are identified by a combination of retention times (our own database) and mass spectra library NIST 75 000 records,

Percentages are calculated from GC/FID peaks areas without using corrections factors,

Chromatographic profile (GC/FID) :

FID1 A, (HARRISINUSA8951.D)



Identification results 1 – PEPPERMINT BATCH N° NG USA

| Peak | RT (min) | Compound | % | Norm (%) | Allergens (%) | Fonction |
|------|----------|----------|---|----------|---------------|----------|
|------|----------|----------|---|----------|---------------|----------|

| | | | | | | |
|----|------|--|--------------|--------------------|------|------|
| 1 | 5,3 | ACETONE | 0,02 | | | CA |
| 2 | 7,2 | BUTANAL 2-METHYL | 0,02 | | | ALD |
| 3 | 7,3 | ISOVALERALDEHYDE | 0,04 | | | ALD |
| 4 | 7,4 | ETHANOL | 0,01 | | | OLA |
| 5 | 8,2 | p-MENTHANE | 0,01 | | | ALCA |
| 6 | 10,8 | α-PINENE | 0,68 | | | M |
| 7 | 10,9 | α-THUYENE | 0,05 | | | M |
| 8 | 11,6 | TETRAHYDROFURANE, 2,5-DIETHYL | 0,02 | | | CF |
| 9 | 12,9 | CAMPHENE | 0,02 | | | M |
| 10 | 13,6 | HEXANAL | 0,02 | | | ALD |
| 11 | 15,1 | β-PINENE | 0,95 | | | M |
| 12 | 15,8 | SABINENE | 0,45 | | | M |
| 13 | 18,0 | β-MYRCENE | 0,13 | | | M |
| 14 | 18,4 | α-PHELLANDRENE | 0,01 | | | M |
| 15 | 18,7 | ψ-LIMONENE | 0,01 | | | M |
| 16 | 19,3 | α-TERPINENE | 0,16 | | | M |
| 17 | 19,8 | ALIPHATIC ESTER | 0,01 | | | EA |
| 18 | 20,6 | LIMONENE | 1,58 | 1 – 2,5 | 1,58 | M |
| 19 | 21,4 | 1,8-CINEOLE + β-PHELLANDRENE | 5,24 | 4,0 – 6,0 | | O |
| 20 | 21,8 | 2-HEXENAL | 0,01 | | | ALD |
| 21 | 22,6 | Cis-β-OCIMENE | 0,17 | | | M |
| 22 | 23,6 | γ-TERPINENE | 0,28 | | | M |
| 23 | 23,8 | Trans-β-OCIMENE | 0,05 | | | M |
| 24 | 24,1 | 3-OCTANONE | 0,02 | | | CA |
| 25 | 25,4 | p-CYMENE | 0,35 | | | M |
| 26 | 25,7 | 2-METHYLBUTYL 2-METHYLBUTYRATE | 0,04 | | | EA |
| 27 | 26,2 | TERPINOLENE | 0,10 | | | M |
| 28 | 26,7 | ISOAMYL ISOVALERATE | 0,09 | | | EA |
| 29 | 29,4 | 1-ETHYLHEXYL ACETATE | 0,02 | | | EA |
| 30 | 29,6 | CYCLOHEXANONE 3-METHYL | 0,02 | | | CT |
| 31 | 30,4 | 1-HEXANOL | 0,01 | | | OLA |
| 32 | 32,6 | 3-HEXEN-1-OL | 0,02 | | | OLA |
| 33 | 32,9 | MYRTENYL METHYL ETHER | 0,02 | | | E |
| 34 | 33,1 | 3-OCTANOL | 0,25 | 0,1 – 0,4 | | OLA |
| 35 | 33,7 | NONANAL | 0,01 | | | ALD |
| 36 | 35,9 | HEXYL 2-METHYLBUTYRATE | 0,01 | | | EA |
| 37 | 37,1 | LINALOOL Cis-OX, + α,p-DIMETHYLSTYRENE | 0,02 | | | O |
| 38 | 37,2 | HEXYL 3-METHYLBUTYRATE | 0,18 | | | EA |
| 39 | 37,4 | Trans-3-METHYLCYCLOHEXANOL | 0,01 | | | OLT |
| 40 | 38,4 | Trans-THUYANOL | 0,91 | 0,5 – 2,3 | | OLT |
| 41 | 39,3 | MENTHONE | 19,97 | 15,0 – 25,0 | | CT |
| 42 | 39,7 | ALKYL COMPOUND | 0,01 | | | CALK |
| 43 | 40,0 | Cis-3-HEXENYL METHYLBUTYRATE | 0,08 | | | EA |
| 44 | 40,3 | MENTHOFURANE | 2,44 | 1,5 – 6,0 | | CF |
| 45 | 40,7 | α-COPAENE | 0,01 | | | S |

Identification results 2 – PEPPERMINT BATCH N° NG USA

SARL PYRENESSENCES ANALYSES - 2, chemin de la plaine - 11340 Belcaire, FRANCE

TEL: +33 (0)4 68 31 77 83 - Courriel : analyses@pyrenessences.com

SIRET 511 930 869 00017 - Code APE 7490B

| Peak | RT (min) | Compound | % | Norm (%) | Allergens (%) | Fonction |
|------|----------|----------|---|----------|---------------|----------|
|------|----------|----------|---|----------|---------------|----------|

| | | | | | | |
|----|------|---------------------------------|--------------|--------------------|------|-----|
| 46 | 41,1 | ISOMENTHONE | 3,20 | 2,0 – 4,5 | | CT |
| 47 | 41,8 | TERPENIC KETONE ISOMER | 0,01 | | | CT |
| 48 | 42,1 | TERPENIC KETONE ISOMER | 0,03 | | | CT |
| 49 | 42,4 | PROPENAL TRIMETHYL CYCLOHEXENYL | 0,15 | | | ALD |
| 50 | 42,6 | β-BOURBONENE | 0,19 | | | S |
| 51 | 42,7 | DIHYDROEDULAN ISOMER | 0,04 | | | CF |
| 52 | 43,0 | NEOMENTHYL ACETATE | 0,22 | | | ET |
| 53 | 43,4 | SESQUITERPENE | 0,01 | | | S |
| 54 | 43,5 | LINALOOL | 0,22 | | 0,22 | OLA |
| 55 | 43,7 | p-MENTH-4-EN-3-ONE | 0,03 | | | CT |
| 56 | 43,9 | Cis-THUYANOL | 0,09 | | | OLT |
| 57 | 44,3 | 1-OCTANOL | 0,02 | | | OLA |
| 58 | 44,4 | MENTHOL ISOMER | 0,02 | | | OLT |
| 59 | 44,7 | ISOPINOCAMPHONE | 0,03 | | | CT |
| 60 | 45,0 | Trans-p-MENTH-2-EN-1-OL | 0,06 | | | OLT |
| 61 | 45,4 | MENTHYL ACETATE | 5,05 | 3,0 – 6,5 | | ET |
| 62 | 45,8 | ISOPULEGOL | 0,13 | | | OLT |
| 63 | 46,1 | Cis-ISOPULEGONE | 0,03 | | | CT |
| 64 | 46,4 | ε-CADINENE | 0,11 | | | S |
| 65 | 46,5 | ISOMENTHYL ACETATE | 0,25 | | | ET |
| 66 | 47,0 | β-ELEMENE | 0,03 | | | S |
| 67 | 47,3 | NEOMENTHOL | 3,72 | 2,5 – 4,5 | | OLT |
| 68 | 47,5 | β-CUBEBENE | 0,06 | | | S |
| 69 | 47,7 | TERPINENE-4-OL | 1,00 | | | OLT |
| 70 | 48,0 | β-CARYOPHYLLENE | 2,13 | 1,0 – 2,5 | | S |
| 71 | 48,3 | ISOISOPULEGOL | 0,05 | | | OLT |
| 72 | 48,6 | AROMADENDRENE | 0,01 | | | S |
| 73 | 49,1 | Cis-p-MENTH-2-EN-1-OL | 0,04 | | | OLT |
| 74 | 49,3 | NEOISOMENTHOL | 0,71 | | | OLT |
| 75 | 50,4 | MENTHOL | 41,96 | 36,0 – 46,0 | | OLT |
| 76 | 50,8 | 1-NONANOL | 0,04 | | | OLA |
| 77 | 50,9 | ALLO-AROMADENDRENE | 0,04 | | | S |
| 78 | 51,1 | PULEGONE | 0,92 | 0,5 – 2,5 | | CT |
| 79 | 51,4 | E-β-FARNESENE | 0,26 | | | S |
| 80 | 51,7 | ISOMENTHOL | 0,21 | | | OLT |
| 81 | 52,0 | δ-TERPINEOL | 0,15 | | | OLT |
| 82 | 52,3 | ESTRAGOLE | 0,05 | | | PE |
| 83 | 52,5 | ALIPHATIC ALCOHOL | 0,03 | | | OLA |
| 84 | 52,7 | α-HUMULENE | 0,12 | | | S |
| 85 | 53,0 | NERAL | 0,04 | | 0,04 | ALD |
| 86 | 53,4 | γ-MUUROLENE | 0,01 | | | S |
| 87 | 53,5 | α-TERPINEOL | 0,24 | | | OLT |
| 88 | 53,7 | Trans-SABINOL | 0,05 | | | OLT |
| 89 | 53,9 | BORNEOL | 0,04 | | | OLT |
| 90 | 54,9 | GERMACRENE D | 1,30 | | | S |

Identification results 3 – PEPPERMINT BATCH N° NG USA

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TEL: +33 (0)4 68 31 77 83 - Courriel : analyses@pyrenessences.com

SIRET 511 930 869 00017 - Code APE 7490B

| Peak | RT (min) | Compound | % | Norm (%) | Allergens (%) | Fonction |
|------|----------|----------|---|----------|---------------|----------|
|------|----------|----------|---|----------|---------------|----------|

| | | | | | | |
|-----|------|-----------------------------------|--------------|--|-------------|------|
| 91 | 55,1 | SESQUITERPENE | 0,03 | | | S |
| 92 | 55,6 | α -MUUROLENE | 0,04 | | | S |
| 93 | 55,8 | ALIPHATIC KETONE Mw=170 | 0,02 | | | CA |
| 94 | 56,1 | PIPERITONE | 0,54 | | | CT |
| 95 | 56,4 | CARVONE | 0,37 | | | CT |
| 96 | 57,0 | 1-DECANOL | 0,04 | | | OLA |
| 97 | 57,2 | CITRONELLOL | 0,03 | | 0,03 | OLA |
| 98 | 57,5 | δ -CADINENE | 0,10 | | | S |
| 99 | 57,8 | γ -CADINENE | 0,02 | | | S |
| 100 | 58,1 | SESQUITERPENE | 0,02 | | | S |
| 101 | 59,2 | METHYL SALICYLATE | 0,01 | | | EAR |
| 102 | 59,3 | MYRTENOL | 0,04 | | | OLT |
| 103 | 61,3 | TERPENIC ALCOHOL | 0,02 | | | OLT |
| 104 | 61,6 | Trans-CARVEOL | 0,02 | | | OLT |
| 105 | 62,0 | GERANIOL | 0,01 | | 0,01 | OLA |
| 106 | 62,1 | CALAMENENE | 0,02 | | | S |
| 107 | 62,3 | p-CYMENE-8-OL | 0,02 | | | OLAR |
| 108 | 62,8 | E-GERANYL ACETONE | 0,02 | | | CAR |
| 109 | 63,2 | PERILLYL ACETATE | 0,02 | | | ET |
| 110 | 64,0 | TERPENIC ALCOHOL | 0,02 | | | OLT |
| 111 | 66,1 | Cis-JASMONE | 0,01 | | | LAC |
| 112 | 67,5 | PIPERITENONE | 0,04 | | | CT |
| 113 | 68,4 | TERPENIC ESTER | 0,02 | | | ET |
| 114 | 68,6 | Trans-JASMONE | 0,02 | | | LAC |
| 115 | 69,3 | TERPENIC ESTER | 0,03 | | | ET |
| 116 | 70,4 | ISOCARYOPHYLLENE EPOXIDE | 0,04 | | | O |
| 117 | 70,6 | PHENYLETHYL ESTER | 0,02 | | | EAR |
| 118 | 71,0 | CARYOPHYLLENE EPOXIDE | 0,13 | | | O |
| 119 | 74,0 | EPOXY-6,7-HUMULENE | 0,01 | | | O |
| 120 | 75,3 | SESQUITERPENOL | 0,02 | | | SOLC |
| 121 | 75,8 | VIRIDIFLOROL | 0,20 | | | SOLC |
| 122 | 77,0 | PHENOL, 2-METHOXY-4-PROPYL Mw=166 | 0,02 | | | PE |
| 123 | 77,7 | SPATHULENOL | 0,07 | | | SOLC |
| 124 | 79,4 | OXYGENED COMPOUND | 0,02 | | | COX |
| 125 | 79,6 | EUGENOL | 0,02 | | 0,02 | PE |
| 126 | 80,0 | THYMOL | 0,05 | | | PH |
| 127 | 81,5 | CARVACROL | 0,01 | | | PH |
| 128 | 82,7 | α -EUDESMOL | 0,01 | | | SOLC |
| 129 | 83,2 | α -CADINOL | 0,01 | | | SOLC |
| 130 | 85,8 | BENZENE, METHYL-4-METHOXY | 0,03 | | | PE |
| 131 | 87,5 | ALIPHATIC ESTER | 0,04 | | | EA |
| 132 | 87,7 | MINT LACTONE | 0,08 | | | LAC |
| 133 | 89,1 | AROMATIC COMPOUND | 0,02 | | | CAR |
| 134 | 90,2 | AROMATIC COMPOUND | 0,02 | | | CAR |
| | | TOTAL | 99,98 | | 1,90 | |

Classification by fonction : PEPPERMINT NG USA

| CODE | FONCTION | NUMBER | % |
|------------------------|-----------------------|------------|--------------|
| TERPENES | | | |
| M | Monoterpene | 15 | 4,99 |
| S | Sesquiterpene | 19 | 4,51 |
| ALCOHOLS | | | |
| OLA | Aliphatic alcohol | 11 | 0,68 |
| OLT | Terpenic alcohol | 21 | 49,49 |
| OLAR | Aromatic alcohol | 1 | 0,02 |
| ESTERS | | | |
| EA | Aliphatic ester | 8 | 0,47 |
| ET | Terpenic ester | 6 | 5,59 |
| EAR | Aromatic ester | 2 | 0,03 |
| KETONES | | | |
| CA | Aliphatic ketone | 3 | 0,06 |
| CT | Terpenic ketone | 12 | 25,19 |
| ALDEHYDES | | | |
| ALD | Aldehyde | 7 | 0,29 |
| OXYDES | | | |
| O | Oxyde | 5 | 5,44 |
| PHENOL | | | |
| PH | Phenol | 2 | 0,06 |
| PE | Phenol Ether | 4 | 0,12 |
| SESQUITERPENOLS | | | |
| SOLC | Cyclic Sesquiterpenol | 5 | 0,31 |
| COMPOUNDS | | | |
| ALCA | Alkane compound | 1 | 0,01 |
| COX | Oxygened compound | 1 | 0,02 |
| CALK | Alkyl compound | 1 | 0,01 |
| CAR | Aromatic compound | 3 | 0,06 |
| CF | Furan compound | 3 | 2,50 |
| E | Ether | 1 | 0,02 |
| LAC | Lactone compound | 3 | 0,11 |
| TOTAL | | 134 | 99,98 |