

**Date :** September 11, 2017

*SAMPLE IDENTIFICATION*

**Internal code :** 17I06-PTH5-1-DM

**Customer identification :** Star Anise - China - A2010264R

**Type :** Essential oil

**Source :** *Illicium verum*

**Customer :** Plant Therapy

*ANALYSIS*

**Method :** PC-PA-001-15E06, "Analysis of the composition of a liquid essential oil by GC-FID" (in French).

Identifications double-checked by GC-MS

**Analyst :** Alexis St-Gelais, M. Sc., chimiste

**Analysis date :** 2017-09-07

Checked and approved by :

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Alexis St-Gelais, M. Sc., chimiste 2013-174

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IDENTIFIED COMPOUNDS

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
Furfural	2.22	844	0.01	0.01	1391	6.70	Furan
$\alpha$ -Pinene	3.41	926	0.62	0.59	941	1.20	Monoterpene
Camphene	3.71	943	0.01	0.01	991	1.50	Monoterpene
Sabinene	4.13	969	0.04	0.03	1057	2.04	Monoterpene
$\beta$ -Pinene	4.20	972	0.05	0.04	1036	1.87	Monoterpene
Myrcene	4.47	989	0.09	0.07	1119	2.72*	Monoterpene
$\alpha$ -Phellandrene	4.75*	1005	0.57	0.30	1106	2.55	Monoterpene
$\Delta^3$ -Carene	4.75*	1005	[0.57]	0.21	1090	2.36	Monoterpene
$\alpha$ -Terpinene	4.94	1015	0.06	[0.07]	1119	2.72*	Monoterpene
para-Cymene	5.13	1025	0.08	0.08	1209	3.89	Monoterpene
Limonene	5.17	1027	0.97	0.80	1138	2.97	Monoterpene
$\beta$ -Phellandrene	5.20	1029	0.28	0.60	1142	3.02*	Monoterpene
1,8-Cineole	5.23	1030	0.18	[0.60]	1142	3.02*	Monoterp. ether
cis- $\beta$ -Ocimene	5.35	1037	0.01	0.08	1191	3.62*	Monoterpene
trans- $\beta$ -Ocimene	5.53	1047	0.02	0.01	1204	3.81	Monoterpene
$\gamma$ -Terpinene	5.72	1057	0.07	[0.08]	1191	3.62*	Monoterpene
cis-Linalool oxide (fur.)	6.00	1072	0.01	0.01	1375	6.45	Monoterp. alcohol
Terpinolene	6.20	1083	0.06	0.05	1224	4.12	Monoterpene
trans-Linalool oxide (fur.)	6.31	1089	0.01	0.01	1402	6.96	Monoterp. alcohol
Linalool	6.70	1106	1.06	1.07	1495	9.18	Monoterp. alcohol
para-Vinylanisole	7.97	1152	0.01				Norphenylpropanoid
Borneol	8.63	1176	0.02	0.16	1618	14.10*	Monoterp. alcohol
Terpinen-4-ol	8.79	1182	0.16	0.56	1524	10.25*	Monoterp. alcohol
Methylchavicol	9.53*	1205	3.52	3.46	1584	12.49*	Phenylpropanoid
$\alpha$ -Terpineol	9.53*	1205	[3.52]	[0.16]	1618	14.10*	Monoterp. alcohol
(Z)-Anethole	11.80	1255	0.27	0.42	1661	16.39*	Phenylpropanoid
para-Anisaldehyde	12.48	1270	0.36	0.42	1885	31.49	Simple phenolic
(E)-Anethole	14.17	1304	88.42	88.47	1735	20.80	Phenylpropanoid
$\alpha$ -Copaene	17.75	1358	0.07	0.07	1429	7.58	Sesquiterpene
Geranyl acetate	19.61	1386	0.09	0.07	1697	18.24	Monoterp. ester
cis- $\alpha$ -Bergamotene	20.63	1401	0.39	0.32	1517	9.99	Sesquiterpene
trans- $\alpha$ -Bergamotene	22.19	1419	0.33	[0.56]	1524	10.25*	Sesquiterpene
$\alpha$ -Humulene	23.41	1434	0.03	[3.46]	1584	12.49*	Sesquiterpene
Viridiflorene	26.44	1470	0.03	[0.16]	1618	14.10*	Sesquiterpene
$\gamma$ -Cadinene	28.85	1499	0.05	0.04	1675	17.12	Sesquiterpene
$\beta$ -Bisabolene	29.10	1502	0.06	[0.42]	1661	16.39*	Sesquiterpene
(E)-Nerolidol	33.85	1569	0.08	0.04	1998	37.07	Sesquiterp. alcohol
$\tau$ -Cadinol	37.51	1637	0.01	0.02	2079	39.68	Sesquiterp. alcohol
$\tau$ -Muurolol	37.62	1640	0.01	0.03	2086	39.90	Sesquiterp. alcohol
(Z)-Foeniculin?	37.86	1646	0.02				Phenylpropanoid
$\alpha$ -Cadinol	38.07	1651	0.05	0.07	2118	40.82	Sesquiterp. alcohol

(E)-Foeniculin	39.42	1684	1.04	1.06	2157	41.82	Phenylpropanoid
<b>Total identified</b>			<b>99.22%</b>	<b>99.18%</b>			

\*: Two or more compounds are coeluting on this column

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

Note: no correction factor was applied

#### OTHER DATA

**Physical aspect :** Light yellow liquid

**Refractive index :**  $1.5518 \pm 0.0003$  (20 °C)

#### CONCLUSION

No adulterant, contaminant or diluent were detected using this method.



