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Certificate of Analysis & Gas Chromatography
Organic Hemlock Spruce Essential Oil
(Tsuga canadensis)

Botanical name:	Tsuga canadensis (L.) Carrière
Commercial name:	Organic Hemlock Spruce
Batch number:	050923-2
Geographical origin:	Canada

Physical and chemical data :

	Standards	Results of analysis
Appearance	Liquid	Conform
Colour	Colourless to pale yellow	Conform
Odour	Characteristic	Conform
Specific gravity at 20°C	0.890 to 0.930	0.9130
Refractive index at 20°C	1.465 to 1.480	1.4692
Optical rotation at 20°C	-30° to +5°	-20.00°
Flash point	+40°C to +50°C	

Table of components :

Components	Contents
Toluene	0.03%
Hexanal	0.01%
(3Z)-Hexenol	0.06%
Hexanol	0.03%
Santene	0.39%
Hashinene	0.01%
Tricyclene	6.16%
Alpha-thuyene	0.22%
Alpha-pinene	21.44%
Camphene	15.34%
Alpha-fenchene	0.04%
Thuja-2.4(10)-diene	0.09%
Benzaldehyde	0.02%
Sabinene	0.03%
Beta-pinene	2.55%
6-Methyl-5-hepten-2-one	0.01%

Dehydro-1.8-cineole	0.03%
Myrcene	2.49%
Pseudolimonene	0.01%
Alpha-phellandrene	1.10%
Menthatriene isomere I	0.04%
Delta-3-carene	0.10%
(3Z)-Hexenyl Acetate	0.03%
Alpha-terpinene	0.02%
Cineole-1.4	0.28%
Para-cymene	0.66%
Beta-phellandrene	1.89%
Cineole-1.8 (Eucalyptol)	0.20%
Limonene	3.77%
Z-beta-ocimene	0.02%
E-beta-ocimene	0.01%
Gamma-terpinene	0.38%
Fenchone	0.02%
Gamma-campholenal	0.11%
Terpinolene	0.64%
Para-cymenene	0.14%
Linalool	0.09%
Alpha-thujone	0.01%
Nonanal	0.02%
Endo-fenchol	0.01%
Beta-thujone	0.01%
Cis-para-menth-2-en-1-ol	0.02%
Alpha-campholenal	0.06%
Nopinone	0.01%
Trans-pincarveol	0.09%
Camphor	0.22%
Camphene Hydrate	0.07%
Isoborneol	0.04%
Pinocamphone	0.01%
Pinocarvone	0.04%
Borneol	0.89%
Alpha-phellandren-8-ol	0.06%
Isopinocamphone	0.04%
Terpinene-4-ol	0.46%
Cryptone	0.04%
Para-cymen-8-ol	0.04%
Methyl Salicylate	0.01%
Myrtenal	0.09%
Alpha-terpineol	0.52%
Myrtenol	0.07%
Verbenone	0.10%
Citronellol	0.06%
Carvotanacetone	0.02%
Piperitone	1.59%

Bornyl Acetate	30.19%
Trans-pinocarvyle Acetate	0.08%
Thymol	0.08%
Myrtenyl Acetate	0.12%
Pin-2-en-8-yl Acetate	1.07%
Terpinyl Acetate	0.05%
Citronellyl Acetate	0.05%
Alpha-ylangene	0.02%
Alpha-copaene	0.05%
Beta-bourbonene	0.01%
Trans-myrtanyl Acetate	0.05%
Geranyl Acetate	0.01%
Beta-elemene	0.02%
Longifolene	0.02%
Beta-caryophyllene	1.11%
Beta-copaene	0.03%
Trans-alpha-bergamotene	0.02%
Alpha-humulene	1.34%
Trans-cadina-1(6).4-diene	0.03%
Gamma-muurolene	0.13%
Germacrene D	0.04%
Beta-selinene	0.08%
Alpha-selinene	0.08%
Alpha-muurolene	0.08%
Gamma-cadinene	0.15%
Z-gamma-bisabolene	0.02%
Delta-cadinene	0.29%
Trans-cadina-1.4-diene	0.02%
Alpha-cadinene	0.01%
Alpha-calacorene	0.02%
E-Alpha-bisabolene	0.01%
E-Nerolidol	0.05%
Caryophyllene Oxide	0.03%
Salvia-4(14)-en-1-one	0.02%
Humulene Epoxyde I	0.01%
Humulene Epoxyde II	0.03%
Tau-cadinol	0.01%
Tau-muurolol	0.01%
Pimaradiene	0.01%
Manool	0.06%
TOTAL	98.57%