

Certificate of Analysis

Product: Black Pepper Oil

Batch Number:237619

Botanical Name: Piper nigrum

Parameter Specification1 Result

Appearance: Clear free flowing liquid Complies

Colour: Colourless to Pale Straw Yellow Complies

Odour: Characteristic: Spicy pepper Complies

Specific Gravity at @ 200C: 0.858 – 0.880

Optical Rotation: -0.00 to + 10.0°

Refractive index at @ 20°C: 1.460 – 1.490

Main Constituents

Sample Component Result (%)

Piper nigrum

Alpha-thujene 1.14

Alpha-pinene 9.60

Camphene 0.26

Sabinene 10.05

Beta-pinene 9.07

Myrcene 1.80

Alpha-phellandrene 1.65

Delta-3-carene 8.90

Alpha-terpinene 0.10

p-cymene 0.47

limonene, beta-phellandrene 15.95

cis-beta-ocimene 0.02

trans-beta-ocimene 0.16

gamma-terpinene 0.21

cis-sabinene hydrate 0.13

terpinolene 0.47

linalool 0.51

terpinene-4-ol 0.28

alpha-terpineol 0.08

delta-elemene 2.34

alpha-cubebene 0.17
alpha-copaene 2.86
beta-elemene 0.81
beta-caryophyllene 26.35
alpha-humulene 0.35
germacrene D 0.28
beta-selinene 0.45
alpha-selinene, bicyclogermacrene 0.55
beta-bisabolene 0.75
delta-cadinene 0.86
caryophyllene oxide 0.32

Note(1)Analytical conditions:GC COLUMNS:Rxi-5SI 1 MS, Length:30.0m, Inside
Diameter:0.25mm,
Thickness:0.25
Mass Spectrometer: Detector Type:Quadrupole Ms, Ion Source:EI, Ion Source Temp:200.0C
Oven Temp Program:Rate:5.0Temperature(Degree):50.0-270.0