

## Essential Oils:

### A. CLOVE ESSENTIAL OILS

The Clove tree provides three types of essential oils including:



- The essential oil of Clove Leaf**, best known as **Clove leaf Oil**. It results from the distillation of the withered leaves of Clove tree. It is mainly produced by farmers in stills craft (mostly built of sheet metal, rarely in aluminum) scattered throughout the regions and Analanjirifo and Antsinanana. The yield is 1 to 2%. Its specification gives a rate of greater than 80% Eugenol. Trimeta Agro Food exports this product especially to Indonesia and India (whose minimum rate guaranteed is **82% of Eugenol**). Primary Use: Chemical, tobacco and cosmetics. Madagascar exports between 1500 and 2500MT Clove Leaf Oil, depending on the year. Trimeta Agro Food processes and exports between 400 to 600MT per year.



#### PHYSICAL AND CHEMICAL PROPERTIES

##### Appearance

Form: liquid mobile, slightly viscous.  
 Color: colorless, purple to dark brown  
 Odor: spicy, characteristic of Eugenol

##### Safety Data:

pH: N/A  
 Melting point: N/A  
 Boiling point: 251.00 °C. @ 760.00 mmHg – lit.  
 Flash point: > 93.3°C  
 Ignition temperature: N/A  
 Lower explosion limit: N/A  
 Upper explosion limit: N/A  
 Density: 1.036 to 1042 25°C  
 Solubility: insoluble in water, soluble in alcohol 70 °  
 Does not contain any oxidizing substance known to ignite spontaneously  
 No risk of explosion at room temperature.

##### Pictogram



SGH 07

Signal word

warning

| CAS (TSCA)N°                                       | CAS (EINECS) N° | EINECS N° | CLASSIFICATION   | CONCENTRATION |
|--|-----------------|-----------|--|---------------|
| <b>Clove Leaf oil; Contains 80% to 85% Eugenol</b> |                 |           |  |               |
| 8000-34-2  | 84961-50-2      | 284-638-7 | Skin irrit.2; eye irrit.2;<br>STOT-SE3;<br>H315, H319, H335 ; Xi,<br>R36/37/38 | 100% natural  |

- **Essential Oil Clove Stem.** It is derived from the steam distillation of stems (peduncle) of cloves, by hand sorting of clove bud for exportation. The yield varies from 4.5 to 6%. The specification is determined by a rate greater than **85% of Eugenol and rate of eugenyl acetate to 5%**. Production is exclusively distilled in Trimeta Agro Food's distillery in Tamatave (production capacity: 400kg/month). Main destination: Pharmaceuticals, tobacco and cosmetics.



#### PHYSICAL AND CHEMICAL PROPERTIES of CLOVE STEM OIL

##### Appearance

Form: liquid mobile, slightly viscous.

Color: colorless to dark brown

Odor: spicy, characteristic of Eugenol

##### Safety Data:

pH: N/A

Melting point: N/A

Boiling point: 251.00 °C. @ 760.00 mmHg – lit.

Flash point: > 100°C

Ignition temperature: N/A

Lower explosion limit: N/A

Upper explosion limit: N/A

Density: 1.42 to 1.63 at 20°C

Solubility: insoluble in water, soluble in alcohol 70 °

Does not contain any oxidizing substance known to ignite spontaneously

No risk of explosion at room temperature.

##### Pictogram



SGH 07

Signal word

warning

| CAS (TSCA)N°                                       | CAS (EINECS) N° | EINECS N° | CLASSIFICATION  | CONCENTRATION |
|--|-----------------|-----------|---|---------------|
| <b>Clove stem oil; Contains 85% to 92% Eugenol</b> |                 |           |   |               |
| 8000-34-8<br>8015-98-3                             | 84961-50-2      | 284-638-7 | Skin irrit.2; eye irrit.2; STOT-SE3;<br>H315 , H319, H335 ; Xi, R36/37/38 | 100% natural  |



- Essential Oil Clove Bud.** It results from the steam distillation of Clove Bud. Best Quality, it is mainly for Fine Fragrances. It contains more than **80% Eugenol and more than 10% eugenyl acetate**. Although, clove bud contains up to 20% of essential oil, but performance rarely reaches 15% in distillation. Main destination: Perfumery, cosmetics, tobacco and pharmaceutical industries. Production is exclusively distillery done by Trimeta Agro Food in Tamatave (production capacity: 1000kg/ month)



#### PHYSICAL AND CHEMICAL PROPERTIES

##### Appearance

Form: liquid mobile, slightly viscous.

Color: colorless to dark brown

Odor: spicy, characteristic of Eugenol

##### Safety Data:

pH: N/A

Melting point: N/A

Boiling point: 251.00 °C. @ 760.00 mmHg – lit.

Flash point: > 93.3°C

Ignition temperature: N/A

Lower explosion limit: N/A

Upper explosion limit: N/A

Density: 1.42 to 1.65 at 20°C

Solubility: insoluble in water, soluble in alcohol 70 °

Does not contain any oxidizing substance known to ignite spontaneously

No risk of explosion at room temperature.

Pictogram



SGH 07

Signal word

warning

| CAS (TSCA)N°                                      | CAS (EINECS) N° | EINECS N° | CLASSIFICATION  | CONCENTRATION |
|---|-----------------|-----------|---|---------------|
| <b>Clove bud oil; Contains 80% to 85% Eugenol</b> |                 |           |   |               |
| 8000-34-2   | 84961-50-2      | 284-638-7 | Skin irrit.2; eye irrit.2; STOT-SE3;<br>H315, H319, H335 ; Xi,<br>R36/37/38 | 100% natural  |