How well-formulated perfumes containing essential oils provide both sensorial and functional benefits to hair and scalp care

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Director Innovation
Head of Paris SOA R&D Center
AGENDA

- Brief Sensient overview
- Definitions
- Essential Oils Screening + Perfumes
- Applications into shampoo and other hair care products
- Conclusions
Sensient Technologies is a leading global developer, manufacturer and marketer of high-quality:

- Colors
- Flavors
- Fragrances
  - *Essential Oils*
  - *Aroma chemicals*
  - *Fragrance compounds*
Vertical integration through production of Essential Oils & Aroma Chemicals ensures quality and supply for our fragrance production.
We offer over a 100 years of proud heritage, combining nature and science, guaranteeing year over year supply of the best Spanish Oils, specially Rosemary, Thyme, Aniseed and Lavandin.

- Origins go back to the beginning of the 20th century. (DGF founded in 1912). Pioneers with over 100 years of experience in essential oils.

- Main line at that time was production/distillation of essential oils from local aromatic plants.

- High quality essential oils thanks to the ideal geographical and climate conditions in Southern Spain (proximity of aromatic plants)

- Range of activities have expanded to aroma chemicals, specialties and perfumery compounds.
**Production Capabilities. Essential Oils Area**

- **Pure Essential Oils**
  - Steam distillation by Sensient (e.g., Ambrette seed oil)
  - Steam distillation by farmers and agricultural cooperatives
  - Traded essential oils (purchased and resale)

- **Compounded Essential Oils** (tailor made ONLY at Sensient Granada)
  - Blending of pure essential oils with natural and synthetic products
  - Cost effective, comply with requirements and legislation (FG, FCC, USP, etc)
  - Better availability (not so limited as pure essential oils)
The compendium will contain a total of 211 products, listed under 3 different tabs:

1st tab: overview of all the pure oils in alphabetic order (184 items)

2nd tab: overview of all the organic oils in alphabetic order (27 items)

3rd tab: overview per olfactory family (we have defined 11 different olfactory families) and with reference to page number.
SENSIENT FRAGRANCES S.A.
PURE ESSENTIAL OILS PRODUCT LIST & ORGANIC ESSENTIAL OILS LIST
1. DEFINITIONS
ESSENTIAL OIL

An essential oil is the volatile liquid found in a variety of plants, trees, shrubs, and citrus fruit rinds. Essential oils are generally extracted by
- Distillation
- Expression
- Solvent extraction
- Cold pressing

⇒ Complex composition: These active compounds are so small that humans can easily absorb them through the skin, nasal passages, lungs, and digestive system.

Use
- Perfumes: soap, shampoo, skin care ...
- Pharmacology: antiseptic, diuretic...
- Aromatherapy: stress...
DANDRUFF

Dandruff has been shown to possibly be the result of three factors:
- Skin oil: sebum or sebaceous secretions
- Micro-organisms (specifically Malassezia yeasts)
- Individual susceptibility and allergy sensitivity

It seems that bacteria (Propionibacterium and Staphylococcus) are more important to dandruff formation than fungi. Bacteria presence is in turn influenced by water and sebum amount.
In other explanation, in presence of dandruff, the levels of Malassezia increase by 1.5 to 2 times its normal level. Penetration by Oleic Acid of the top layer of the epidermis, the stratum corneum, results in an inflammatory response in susceptible persons which disturbs homeostasis and results in erratic cleavage of stratum corneum cells.
HAIR STIMULATION

Every hair on a healthy scalp is connected to a blood vessel => receives nutrients and grows. However, hair loss sufferers have an extremely weak supply of blood to their hair follicles.
- massage
- heat

AROMATHERAPY

Practice of using volatile plant oils, including essential oils => “odour” receptors in the nose communicate with parts of the brain: stimulate and influence physical, emotional, and mental health
2. ESSENTIAL OILS

SCREENING
A screening of the 211 known essential oils was carried out using free patents and ncbi.nlm, to identify the top 8 essential oils with greatest benefits to hair and scalp care:

- Bergamot
- Eucalyptus
- Grapefruit
- Lavender
- Peppermint
- Rosemary
- Sage
- Tea Tree
BERGAMOT ESSENTIAL OIL

COMPOSITION

- D Limonene 38%
- Linalyl Acetate 28%
- Linalol 11%
- Gamma Terpinene 7%
- Beta Pinene 5.7%
- Sabinene 1%
- Myrcene 1%
- Bergaptene

CLAIM

- **Antidandruff**: due to content of Flavanones. Hesperidin is a flavanone glycoside found in citrus fruits.*

- **Stimulating Hair Growth**: by increasing circulation in the hair **

- **Aromatherapy effect**: by decreasing stress ***

PERFUME

Cosmo Lime

54.580.0660

with 0.1% Bergamot Essential Oil

Apple, Pear, Plum, Green, Bergamot

Lilac, Rose, Lily Of the valley, Freesia

Peach, Powdery, Woody

Eucalyptus Essential Oil

**Composition**

- 1,8 Cineol 66%
- Alpha Pinene 14%
- D limonene 4%
- Globulol 3%
- Para Cymene 2%
- Beta Pinene

**Antidandruff**: The presence of rich phenolic compounds like Thymol, 1,8-Cineole, Beta-Pinene and Alpha-Pinene present in the E. globules contribute to the bioactivity*

**Claim**

**Perfume**

- **Fresh Eden**
  - 54.680.0661
  - With 0.1% Eucalyptus Essential Oil
  - Watermelon, Apple, Green, Minty, Eucalyptus
  - Lily of the valley, Cyclamen
  - Ozone, Sandalwood, Musky

*The zone of inhibition mm

*Concentration of Essential oils

*Figure 2. Antidandruff activity of essential oils.

**Composition**
- D-limonene 85%
- Myrcene 1.4%
- Octanal 0.6%
- Dacanol 0.4%
- Nootkatone 0.1%

**Claim**
- **Antidandruff**: due to content of Flavanones: hesperidin is a flavanone glycoside found in citrus fruits*

**Perfume**
**Energy Pump**
54.580.0382
With 0.1% Grapefruit Essential Oil

Grapefruit, Green, Apple, Eucalyptus
Lavender, Green Tea, Aldehydic, Freesia
Patchouli, Sandalwood, Mossy, Musky

---

**COMPOSITION**

- Linalyl Acetate 38%
- Linalool 30%
- Ocimene (mix) 4.5%
- Lavandulyl Acetate 4%
- Beta Caryophyllene 3%
- Terpinen-4-ol 3%
- 1,8 Cineole 1.5%
- 3-Octanone, Lavandulol, Borneol

**CLAIM**

***Stimulating Hair Circulation:***
when a daily scalp massage is done with lavender => New hair grow ⭐

**Aromatherapy Effect:**
- Decrease blood pressure **
- Minimize stress due to acetate linalyle and linalool ingredients ***

**PERFUME**

**Calm Moment**

54.680.0658

With 0.1% Lavender Essential Oil

Lime, Grapefruit, Orange, Rosemary

Aldehydic, Minty

Lavender

***http://www.freepatentsonline.com/20110028549.pdf***


**COMPOSITION**

- Menthol 42%
- Menthone 20%
- Trans Sabinene Hydrate 6%
- 1,8 Cineol 5%
- Isomenthone 4%
- Neomenthol 4%
- Menthofuran 2%

**CLAIM**

- **Stimulate hair circulation** ⇒ **Hair Grow**

**PERFUME**

**Iced Play**

54.680.0663

With 0,1% Peppermint Essential Oil

Peppermint, Minty, Pineapple, Orange, Green

Lavender, Rose, Pear, Melon

Musky

Comparison of the hair growth effect in C57BL/6 mice. The back skins of the mice were shaved and test compounds were topically applied for 4 wks. The hair growth effect was calculated using scoring index: 0~19% (1), 20~39% (2), 40~59% (3), 60~79% (4), and 80~100% (5). Each point represents the mean ± SD of 5 mice. SA; saline, JO; jojoba oil, MXD; 3% minoxidil, PEO; 3% peppermint oil.

**Composition**

- 1.8 Cineole 22%
- Camphor 18%
- Alpha Pinene 18%
- Camphene 10%
- D limonene 5%
- Beta Pinene 4%
- Para Cymene 3%
- Borneol, Verbenone, Linalool, Myrcene

**Claim**

- **Antidandruff**: contains antibacterial and antifungal compounds (1,8 Cineole) which can treat the dandruff and restore balance to your scalp.

**Perfume**

- **Perfect Vitality**
- 54.680.0659
- With 0.1% Rosemary Essential Oil

Lime, Grapefruit, Orange, Rosemary

Aldehydic, Minty

Lavender

*Antidandruff: contains antibacterial and antifungal compounds (1,8 Cineole) which can treat the dandruff and restore balance to your scalp.*

**http://www.freepatentsonline.com/20110028549.pdf**

**COMPOSITION**

- Camphor 23%
- 1,8 Cineole 22%
- Alpha Pinene 7%
- Camphene 7%
- Sabinene 7%
- Beta Pinene 4,5%
- Viriflorol 3%, Alpha Terpineol 3%, D limonene 3%
- Borneol 2%

**CLAIM**

- **Aromatherapy Effect**: Antidepressant-like effect of Salvia sclarea is explained by modulation of dopamine activities in rats* **

**PERFUME**

- **Aromatic Firmin**
  - 54.680.0657
  - With 0,1% Sage Essential Oil

- Lime, Green, Apple
- Lavender, Marine, Cedarwood
- Sandalwood, Tonka, Mossy, Musky

- **Terpineol 36%**
- ** Gamma Terpinene 20%**
- ** Alpha Terpinene 10%**
- ** 1,8% Cineole 4%**
- ** Terpinolene 3,5%**
- ** Para Cymene 3%**
- ** Sabinene 1,2%**

- **Antidandruff:** Tea tree oil is a very powerful natural antibacterial and it also has excellent anti-inflammatory and antifungal compounds making it an excellent choice for dandruff reduction regardless of the cause of your condition*

**Perfume**

**Dark Mood**

54.680.0662

With 0,1% Tea Tree Essential Oil

Minty, Spearmint

Spearmint, Apple

Minty, Spearmint

*http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1360273/*
3. ESSENTIAL OILS
APPLICATION IN HAIR CARE
## Development Formulation

**Shampoing transparent Sulfate Free**

<table>
<thead>
<tr>
<th>Product (INCI Name)</th>
<th>Functionality</th>
<th>% w/w</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water (Aqua)</td>
<td></td>
<td>To 100</td>
</tr>
<tr>
<td>Crodestanic LS30 NT (Sodium Lauroyl Sarcosinate)</td>
<td>Anionic Surfactant</td>
<td>30.0</td>
</tr>
<tr>
<td>Crodesteric CAB 38 (Cocamidopropylbetaine)</td>
<td>Amphoteric Surfactant</td>
<td>10.0</td>
</tr>
<tr>
<td>Glycyrhizin (Glycyrrhizin)</td>
<td>Humectant</td>
<td>2.00</td>
</tr>
<tr>
<td>Versatilith PEC-150 Pentaesetyl Tetraseterate (and) PPG-2 Hydroxyethyl Cocomamide (and) Aqua</td>
<td>Rheology Modifier</td>
<td>5.00</td>
</tr>
<tr>
<td>Sorbate de potassium (Potassium Sorbate)</td>
<td>Preservative</td>
<td>0.40</td>
</tr>
<tr>
<td>Benzoate de Sodium (Sodium Benzoate)</td>
<td>Preservative</td>
<td>0.40</td>
</tr>
<tr>
<td>Acide Lactique (Lactic Acid)</td>
<td>pH Adjuster</td>
<td>qs</td>
</tr>
</tbody>
</table>

### Suppliers

1. Croda

### Method

1. Disperser les conservateurs dans l’eau puis ajouter la glycérine, le Crodestanic et le Crodesteric.
2. Chauffer le mélange à 65°C en homogénéisant.
3. Ajouter le Versatilith sous agitation forte.
4. Ajuster le pH avec l’acide lactique.

**Remarque** : le Versatilith peut être incorporé avant le chauffage.
## Development Formulation

### Shampooing Green APG

<table>
<thead>
<tr>
<th>Product (INCI Name)</th>
<th>Functionality</th>
<th>% w/w</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water (Aqua)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crodasinic LS30 NT (Sodium Lauroyl sarcosinate)</td>
<td>Anionic Surfactant</td>
<td>10.0</td>
</tr>
<tr>
<td>Crodaticin CAB 30 (Cocamidopropylbetaine)</td>
<td>Anionic Surfactant</td>
<td>10.0</td>
</tr>
<tr>
<td>Oranlix NT 10 (Decyl glucoside)</td>
<td></td>
<td>10.0</td>
</tr>
<tr>
<td>Versatisil (PEG-150 Pentaerythyltetraesterate (and) PPG-2 Hydroxyethyl Cocomide (and) Aqua)</td>
<td>Rheology Modifier</td>
<td>3.00</td>
</tr>
<tr>
<td>Sorbate de potassium (Potassium Sorbate)</td>
<td>Preservative</td>
<td>0.40</td>
</tr>
<tr>
<td>Benzozate de Sodium (Sodium Benzoate)</td>
<td>Preservative</td>
<td>0.40</td>
</tr>
</tbody>
</table>

**Sample: 1:1 Croda 2: Seppio**

**Method**

1. Disperser les conservateurs dans l'eau puis ajouter le Crodasinic, le Crodaticin et l'Oranlix.
2. Chauffer le mélange à 55°C en homogénéisant.
3. Ajouter le Versatisil sous agitation lente.

**Remarque:** Le versatisil peut être ajouté avant le chauffage, on obtient le même résultat.
Hair Care Formulation

Spray Capillaire SOS Selfie

Development Formulation

Spray Capillaire SOS Selfie

A concept innovateur destiné aux adolescents. Cette formule développée pour être utilisée en toutes circonstances et dans toutes les poses, va permettre aux démêlés d'être présents et toujours au top pour obtenir le selfie parfait. Placez d'hydratation et cohesion sont de la partie pour apporter vitalité (Crodamol STS) et fraîcheur (Crodamol W). Avec de fines particules associées à une texture étonnante à la fois, Capillaire SOS Selfie, un cas de résistance, a trouvé un allié dans Crodamol PL, il n'aura jamais été aussi simple et pratique de sublimer ses cheveux. Cette formule est équipée d'un complexe hydratant unique adapté aux cheveux gras et d'un extract de pois (Crodamol Pearl Extract). Le spray Capillaire SOS Selfie laisse prendre tout des cheveux les plus démêlés et se faire adopter pour devenir un aboutir incomparable des saillis réussis.

Product (INCI Name) | Functionality | % w/w
---|---|---
**Phase A**  
Water (Aqua) | Humectant | 70.00
Priseline™ 301 (Glycerin™) | 4.00
**Phase B**  
Volarest™ FL (Achilles Benzenethiol Methylacrylate Copolymer) | 1.50
**Phase C**  
Crodamol™ W (Stearyl Heptanoate and Stearyl Caprylate) | 0.50
DuroQuench™ IQ 2 (Cetyl Alcohol and Isododecanol Iodide and Isostearate and Potassium Iodine Phosphate and Cetyl Dimethyl Phosphate and Cetyl Iodate and Cetyl Iodide and Cetyl Stearate and Cetyl Alcohol and Isododecanol) | 1.60
Crodamol™ Pearl Extract (Water (And) Glycerin (And) Hydrogenated Palm Oil (And) Sorbitan Palmitate (And) Hydrogenated Castor Oil (And) Glycerin (And) Phenoxyethanol (And) Potassium Sorbate (And) Lactic Acid (And) Sodium Hydroxide (And) Phenoxyethanol (And) Salicylic Acid (And) Ethylhexylglycerin (And) Benzyl Alcohol (And) Polyacrylate (And) Sodium Benzoate)) | 0.05
**Phase D**  
TEA (50%) (Triethanolamine) | pH Adjuster | Gap
**Phase E**  
Etvol PF 2018 (Phenoxyethanol and Ethylhexyglycerin) | Preservative | 1.00
Crodamol™ Pearl Extract (Water (And) Glycerin (And) Hydrogenated Palm Oil (And) Sorbitan Palmitate (And) Hydrogenated Castor Oil (And) Glycerin (And) Phenoxyethanol (And) Potassium Sorbate (And) Lactic Acid (And) Sodium Hydroxide (And) Phenoxyethanol (And) Salicylic Acid (And) Ethylhexylglycerin (And) Benzyl Alcohol (And) Polyacrylate (And) Sodium Benzoate)) | 0.05
Kohlenperstoff Iod violetbeständig (Synthetic Rubidium Phosphate and Ethyl Salicylate and Titanium Dioxide and C.I. 77510) | Pigment | 0.20
D&C Red 33 # (50%) (C.I. 17200) | Pigment | 0.11
Lovely World® | Perfume | 0.2


**DuroQuench™ IQ SA**  
Complex hydrating unique for skin and hair
- Systeme d'hydratation intelligent par occlusion intense
- Efficacité prouvée pour les produits incolores et non-résinés
- Propriétés conditionnantes perceptibles par l’utilisateur

**Volarest™ FL**  
Libre de votre formule en toute légitimité
- Technologie « Fly and Stay »
- Libération ciblée et contrôlée d'émulsions sprayables
- Excellentes propriétés thixotropes
- Liquide facile à utiliser et procesensible à froid

**Crodamol™ W**  
Apport de fraîcheur tout en douceur
- Émulsion léger qui fond au contact de la peau
- Crée un effet d'évaporation
- Toucher sec et fin coussin
- 100 % naturel et approuvé ECO certifié

**Crodamol™ STS**  
Booster la brillance des cheveux sans silicium
- Éviter d'émulsion alternat aux siliciums
- Booste la brillance de la chevelure
- Améliore l’esthétique des épaisses et diminue le collant
# Hair Care Formulation

## Cooling Scalp Soother

**Development Formulation**

<table>
<thead>
<tr>
<th>Description</th>
<th>Inactive Ingredient</th>
<th>% w/w</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase A</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water (Aqua)</td>
<td>To 100</td>
<td></td>
</tr>
<tr>
<td>Glycol (99%)</td>
<td>Humectant</td>
<td>4.00</td>
</tr>
<tr>
<td>Volarest® FL (Acrylates/Beheneth-25 Methacrylate Copolymer)</td>
<td>Rheology Modifier</td>
<td>1.00</td>
</tr>
<tr>
<td><strong>Phase B</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crodamol™ W (Stearyl Heptanoate (and) Stearyl Caprylate)</td>
<td>Cooling Emollient</td>
<td>1.00</td>
</tr>
<tr>
<td>DuraQuench™ IQ (Cetyl Alcohol (and) Isostearate Isostearate (and) Potassium Cetyl Phosphate (and) Cetyl Behenate (and) Behenic Acid)</td>
<td>Moisturiser/Conditioner</td>
<td>2.50</td>
</tr>
<tr>
<td>Crodamol™ GTCC (Capryloyl Capric Triglycerides)</td>
<td>Emollient</td>
<td>1.00</td>
</tr>
<tr>
<td>Seactions Wheatgerm Oil (Triticum Vulgare (Wheat) Germ Oil)</td>
<td>Emollient</td>
<td>2.00</td>
</tr>
<tr>
<td><strong>Phase C</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Butyl PE 9010 (Phenoxyethanol (and) Ethylenoxycylyl)</td>
<td>Preservative</td>
<td>1.00</td>
</tr>
<tr>
<td>Sodium Hydroxide (25%) (Sodium Hydroxide)</td>
<td>pH Adjuster</td>
<td>1.00</td>
</tr>
</tbody>
</table>

**Suppliers:**
1. Croda
2. Croda Seactions
3. Savannah Fine Chemicals
4. Radhammer

**Method**

Heat the water to 70-75°C, add Glycol. Add the Volarest FL to the batch. Heat the phase B ingredients to 70-75°C. Combine when both phases are at 70-75°C, homogenise until smooth and uniform. Remove the homogeniser and insert the propeller stirrer, stir to cool to 40°C-45°C. Adjust the pH using sodium hydroxide to 7.0. Stir slowly. Add the preservative and mix slowly after addition until uniform.

---

## DuraQuench™ IQ SA

**Product name**

DuraQuench IQ SA

**InCI name**

Cetyl Alcohol (and) Isostearate Isostearate (and) Potassium Cetyl Phosphate (and) Cetyl Behenate (and) Behenic Acid

**Appearance**

White paste

**Leave-on Features/Benefits**

- Up to 72 hours long lasting hydration
- Temperature and humidity responsive
- Visible improvement in skin dryness
- Delivers superior moisturisation via dual action technology

**Wash-off Features/Benefits**

- Physical reduction in skin drying in body and hand washes
- Proven skin and scalp moisturisation benefits
-Delivers additional hair conditioning attributes
- Consumer-persuasive for both the skin and hair

**Applications**

- Daily facial care
- Anti-aging
- Body care
- Sun care
- Scalp and hair care
- Soaps and detergents

**Seasonal variation and temperature controlled environments can lead to skin dryness. DuraQuench IQ SA has been developed to combat these changes in temperature and humidity, specifically by reducing water loss, more effectively at low relative humidity. With effective moisturisation contributing towards anti-aging performance. DuraQuench IQ SA delivers a significant improvement in skin barrier function for lasting hydration benefits.**
## Scalp Quenching Conditioner

<table>
<thead>
<tr>
<th>Product (INCI Name)</th>
<th>Functionality</th>
<th>% w/w</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase A</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incrocram™ Behenyl TMS-50 (Behentrimonium Methosulfate (and) Cetyl Alcohol (and) Butylene Glycol)</td>
<td>Cationic emulsifier</td>
<td>3.00</td>
</tr>
<tr>
<td>Crodamol™ STS (PPG-3 Benzyl Ether Myristate)</td>
<td>High gloss emollient</td>
<td>3.00</td>
</tr>
<tr>
<td>Cutissential™ 18-MEA 40 (C10–40 Isodecamidopropylhydroxydimonium Ethosulfate (and) Dipropylene Glycol)</td>
<td>Highly substantive hair conditioning agent</td>
<td>2.00</td>
</tr>
<tr>
<td>DuraQuench™ IQ SA (Cetyl Alcohol (and) Isostearyl Isostearate (and) Potassium Cetyl Phosphate (and) Cetyl Stearate (and) Stearic Acid)</td>
<td>Moisturising complex</td>
<td>1.00</td>
</tr>
<tr>
<td>Keradyn™ HH ( Bis-Ethylisostearylimidazoline Isostearamide)</td>
<td>Conditioning agent</td>
<td>1.00</td>
</tr>
<tr>
<td><strong>Phase B</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Deionised (Aqua)</td>
<td>-</td>
<td>To 100</td>
</tr>
<tr>
<td><strong>Phase C</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lactic Acid</td>
<td>pH adjuster</td>
<td>To pH 4-4.5</td>
</tr>
<tr>
<td>Euxyl PE9010 (Phenoxyethanol (and) Ethylhexylglycerin)²</td>
<td>Preservative</td>
<td>0.40</td>
</tr>
</tbody>
</table>

Suppliers: 1: Croda  2: Schulke & Mayr
<table>
<thead>
<tr>
<th>Product / INCI Name</th>
<th>Control (%/w/w)</th>
<th>DuraQuench IQ SA (%/w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Deionised (Aqua)</td>
<td>To 100</td>
<td>To 100</td>
</tr>
<tr>
<td><strong>Incroquat™ Behenyl TMS-50</strong> (Behentrimonium Methosulfate (and) Cetyl Alcohol (and) Butylene Glycol)</td>
<td>3.00</td>
<td>3.00</td>
</tr>
<tr>
<td>Crodamol™ STS (PPG 3 Benzyl Ether Myristate)</td>
<td>5.00</td>
<td>5.00</td>
</tr>
<tr>
<td><strong>DuraQuench™ IQ SA</strong> (Cetyl Alcohol (and) Isostearyl Isostearate (and) Potassium Cetyl Phosphate (and) Cetyl Stearate (and) Stearic Acid)</td>
<td>-</td>
<td>1.0</td>
</tr>
<tr>
<td>Crodacid™ C90 (Cetyl Alcohol)</td>
<td>1.20</td>
<td>0.60</td>
</tr>
<tr>
<td>Preservative</td>
<td>0.50</td>
<td>0.50</td>
</tr>
<tr>
<td>Sodium Hydroxide (pH to 4.0)</td>
<td>q.s.</td>
<td>q.s.</td>
</tr>
</tbody>
</table>

*Table 8: Test Conditioner Formulations*
3. CONCLUSIONS
• With this presentation we clearly demonstrate that essential oil play an important sensorial and functional role in hair and scalp care formulations when properly formulated.

• The sensorial role is linked to there respective olfactory character. Sensient Fragrances perfumers demonstrate that, trendy & creative olfactory concepts, can be developed using our premium essential oils.

• The functional role is due to the complex composition of essential oils. They have a strong activity for anti dandruff, hair grow and aromatherapy.

• As always, the finish product formulation is acting as a vehicle for active ingredients such as essential oils. For product claim, bear in mind that the best active ingredient with inappropriate personal care formulation will lose efficiency.
Thank you
• Annexe 1a: http://www.freepatentsonline.com/20070129428.pdf


• Annexe 1c: http://www.ncbi.nlm.nih.gov/pubmed/21105176

• Annexe 2: http://www.apjtc.com/zz/2012s2/33.pdf
• Annexe 3: http://www.freepatentsonline.com/20110028549.pdf
• Annexe 4:
• Annexe 5: www.ncbi.nlm.nih.gov/pubmed/21157172
• Annexe 7: http://www.ncbi.nlm.nih.gov/pubmed/25584150
• Annexe 8: http://www.ncbi.nlm.nih.gov/pubmed/23833718
• Annexe 10: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1360273/