

THE CHEMISTRY OF ESSENTIAL OILS *Made Simple*

*A Guide to Understanding Chemical Families & Their Properties,
Actions & Effects: Hormone Balance, Depression, Anxiety, Sleep,
Mood, Weight Loss, Infections, Autoimmunity & More*



KG Stiles, BA, CBP, CBT, LMT Certified Clinical Aromatherapist

The Chemistry of Essential Oils Made Simple
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Mood, Weight Loss, Infections, Autoimmunity &
More*

By KG Stiles, BA, LMT, CBT, CBP
Certified Clinical Aromatherapist & Consultant

www.kgstiles.com

www.PurePlantEssentials.com

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INTRODUCTION

Welcome to, *The Chemistry Essential Oils Made Simple*. I'm KG Stiles, an earth-loving certified clinical aromatherapist and licensed and accredited holistic health practitioner for more than four decades. I've worked with many celebrities and have been referred to as the, "Aromatherapist to the Stars!" My advice and services have included not only internationally famous celebrities and athletes, but also entrepreneurs and top executives, individuals, small business owners, spa therapists, hospitals and medical centers.

As a young child, my genuine desire to help people feel better fueled my passion to be of service and led me into the health profession. After being introduced to essential oils, I realized that I had found what I'd been looking for my entire life. One sniff of pure plant essences can instantly help anyone feel better. My curiosity drove me to find out exactly why essential oils could produce such profound and almost instantaneous results. Learning about the chemistry of essential oils unlocked many of the secrets of essential oils and understanding how and why they work so well. I invite you to join me on a journey into the inner workings of aromatherapy. Let's get started!

Highlights

This guide will give you an insider's look at the chemistry of essential oils and why their chemical components work to produce the extraordinary benefits essential oils are renowned for.

From treating infectious disease, to alleviating depression and anxiety, you'll discover why essential oils can be used to effectively relieve a wide variety of physical health and psycho-emotional issues.

Two of the Most Important Modern-Day Health Issues for using Essential Oils are: Infectious Disease and Opioid Addiction.

Infectious Disease

You'll be introduced to the best essential oils to use for boosting your immune function. These oils will give you the additional support needed to prevent and relieve all types of infections, including the common cold and flu.

You'll learn what the latest research shows about these oils and why you'll want to consider using them for a variety of home health care therapies.

We've entered the 'post antibiotic era' when alternative solutions to treat infections have become crucial to our survival as a species. In 2013, the Alliance for Aging Research, released results of studies showing that 1.7 million Americans develop hospital-acquired infections (HAI) each year, and 99,000 die of HAIs annually. Three-fourths of these infections start in nursing homes and doctors' offices. The economic burden to the U.S. is estimated to be as high as \$45 billion per year.

A 2018 study, estimated that about 33,000 people die annually, as a direct consequence of an infection due to bacteria resistant to antibiotics, and that the burden of these infections is comparable to that of influenza, tuberculosis and HIV/AIDS combined.

Why antibiotics are fast becoming obsolete?

Antibiotic resistance occurs when bacteria adapt and evolve to withstand the threat of death by an antibiotic. The problem is that bacteria are able

to grow and change faster than new antibiotics can be developed to eliminate them.

Consequently, the effectiveness of drugs, chemicals, or other agents designed to cure or prevent infections becomes rapidly obsolete.

[News at Medical Life Sciences](#) puts it simply, “The problem with current treatments is that they are made of single compounds which MRSA relatively quickly becomes resistant to, so treatment is only successful in around 50% of cases.” The report also tells us, “The reason essential oils are so effective is because they are made up of a complex mixture of chemical compounds which the MRSA and other super bug bacteria finds difficult to resist.”

However, the researchers are having a problem finding funding to support their research as, “Essential oils cannot be patented as they are naturally occurring, so few drug companies are interested in our work as they do not see it as commercially viable.” The scientists heading this crucial research found this situation to be, “Very frustrating as we believe our findings could help to stamp out MRSA and save lives.”

Despite the roadblocks the development of new ‘nature’ based pharmaceutical is underway.

This developmental research is fueled by many factors, including alternative therapies being viewed favorably by many patients, often because they are not being helped by conventional treatments. There is also a perception that alternative natural therapies have fewer harmful side effects. Many patients report significant improvement when taking complementary and alternative medicines. Unfortunately, until recent years, the conventional established medical profession has been slow to adopt alternative ‘nature based’ therapies.

The increasing threat of antibiotic resistant strains of bacteria is probably the most important factor for spurring conventional medicine into conducting research on essential oils and their chemical components. This research has added a tremendous body of evidence for using essential oils. The positive results of this body of research is causing the world of medicine to sit up and take notice of the efficacy of using essential oils to treat a host of health issues.

Opioid Addiction

Additionally, in this guide, you'll discover the best essential oils to use for relieving fear, stress, depression, worry, insomnia, irritability, anxiety, and anger issues.

Sedative drugs such as Valium and Opioid Pain Killers, examples of which include codeine and morphine, are some of the most widely prescribed prescription drugs worldwide. Oxycodone is one of the most prescribed prescription pain relievers. It is also one of the **most common drugs involved in prescription opioid overdose fatalities**.

These drugs pose major health risks. Research indicates prescribing them may contribute to shortened life expectancies.

Consequently, opioid addiction has become a grave concern in medicine. Research is now being conducted on herbs and essential oils to complement, or even replace opioids in some cases. In fact, a **clinical trial showed evidence** supporting the use of Rosemary for opium withdrawal during addiction treatment programs.

Chemistry - The Science of Aromatherapy

This introduction and explanation of the organic building blocks of essential oils is meant to be a helpful reference guide for to you refer to as needed.

It will give you a basic understanding of the chemical make-up of essential oils, and their therapeutic properties, actions, and effects.

Using archetypes to describe each of the chemical families can make your journey into the chemistry of essential oils more fun, as well as easier to remember all the families.

Using Aromatherapy Archetypes as the 12 Natural Healers of Aromatherapy can be used for blending ideas, as well as to remember information on the healing properties for each chemical family.

Chemistry Basics

Essential oils are composed of complex mixtures of volatile organic compounds. All of life is made of three (3) elements carbon, hydrogen and oxygen. These three molecules are the components of every essential oil.

Based on their distinguishing qualities, each chemical family can be divided into 12 Archetypes and their characteristic Elemental Powers. These 12 archetypes, and their chemical families, tell us about the therapeutic properties, actions and effects of essential oils.

You can select essential oils based on their specific archetype and therapeutic chemical properties, actions and effects to formulate aromatherapy blends for healing specific conditions.

In this book you'll learn about:

- Aromatherapy Archetypes - 12 Natural Healers - starting with The Male Athlete/Monoterpene.
- Healing Tools - Plant Identification - How to Select Your Essential Oils.
- The Twelve (12) Elemental Powers of each Aromatherapy Archetype.
- The Twelve (12) Chemical Families Specific properties, actions and effects.
- Pure essential oils in each family.
- Any cautions for each chemical family.

This information is for educational purposes only, and not meant to take the place of diagnosis or treatment by a qualified medical professional. Though all statements are believed to be accurate, actual results in practice when using essential oils is individual. No expressed or implied effects are guaranteed, nor liability taken. Please consult your physician regarding serious health concerns and do not attempt to self-diagnose.

Healing Tools - Plant Identification - How to Select Your Essential Oils

- The Latin name for each plant is listed for each essential oil. This is important as it identifies the exact type of essential oil to select.
- A Latin name, or botanical name, is the most precise way to identify a particular plant. Many plants will have several varieties. Each species of a plant has different aromas and therapeutic qualities.
- In order to know the chemical make-up and properties of an essential oil, the label on a bottle of essential oil must include the species of the plant.

In general, pure essential oils can be subdivided into two distinct groups of chemical constituents:

1. Hydrocarbons which are made up almost exclusively of terpenes (monoterpenes, sesquiterpenes)
2. Oxygenated compounds which are mainly esters, aldehydes, ketones, alcohols, phenols, and oxides, ethers and lactones.

PLEASE NOTE: An essential oil can be classed in more than one chemical family, based upon the percentage of a chemical component in an essential oil.

1 - MONOTERPENE – THE MALE ATHLETE

Monoterpene compounds are a class of terpenic hydrocarbons. Terpenic compounds end with -ene.

Monoterpene are generally found in most all essential oils, and are known to react readily to heat, light, and air sources. For this reason, bottles containing pure essential oils need to be tightly sealed and kept in a cool, dark place for storage.

ARCHETYPE: The Male Athlete.

ELEMENTAL POWER: Masculine (Yang character), promotes strength, stability, courage, endurance, stamina, strength and agility.

Citrus oils are especially high in monoterpene hydrocarbons and readily oxidize when left open to light and air.

MONOTERPENE PROPERTIES

Monoterpenes contain only hydrogen and carbon molecules (hydrocarbons).

Pinene and Limonene are the two most common -terpenes making up Essential Oils.

Limonene - found in Bergamot, Lemon, Orange and other Citrus Oils. It gives the plant a citrusy, orange-like aroma. Limonene has antibacterial, antifungal, and **antidepressant effects** and has been used for weight loss.

Research reports suggest that limonene has **anti-carcinogenic properties**.

Pinene- found in Coriander, Eucalyptus, Black Pepper, Oregano and conifer oils like **Pine**, Cypress, Spruce and Juniper. Pinene gives a plant a characteristic pine tree aroma.

Alpha-pinene is one of the most well-known terpenes. It gives the plant a more woody and earthy aroma. Research shows it has a **powerful energizing effect on the brain** and can aid attention and focus. It can be

used as a topical antiseptic, a natural expectorant and bronchodilator for respiratory health. These oils are frequently used as insect repellents.

Monoterpene Actions & Effects:

Stimulant - an agent that quickens the physiological functions of the body, temporarily increases body or organ function, good for convalescence, poor circulation, listlessness, physical fatigue.

Analgesic - pain reliever.

Anti-inflammatory - relieves inflammation.

Antiseptic - helps control infection.

Anti-viral - prevents or inhibits viral activity, destroys virus.

Tonic - strengthens and enlivens the whole or specific parts of the body.

Rubefacient - Warming, agent which reddens skin, dilates vessels, increases blood flow.

Astringent - drying, causes contraction of organic tissues.

Diuretic - increases urine flow.

Deodorizer - excellent air freshener, airborne deodorizer.

Decongestant - entire body.

Expectorant - helps promote the removal of mucus from respiratory system, stimulates the action of decongestion for the entire body, heals respiratory system.

Essential Oils in this Class (partial list)

Preferred distillation method, part of plant used, and some best locations for production.

ANGELICA - (Angelica archangelica), steam distilled root or seed, France.

BERGAMOT - (Citrus bergamia), cold pressed peel, Italy.

BLUE TANSY - (*Tanacetum annuum*), steam distilled flower tops, Morocco.

CUMIN - (*Cuminum cyminum*), steam distilled seed, Egypt.

CYPRESS - (*Cupressus sempervirens*), steam distilled leaf, Crete, Mediterranean region.

ELEMI - (*Canarium luzonicum*), steam distilled resin, Philippines.

EUCALYPTUS (*Eucalyptus globulus*, *E. radiata*), steam distilled leaf, Australia.

FIR, Douglas - (*Pseudotsuga menziesii*), steam distilled needles, Canada.

FRANKINCENSE/OLIBANUM - (*Boswellia fereana*, *B. serrata*, *B. carterii*), steam distilled resin tears, India or Somalia.

PEPPER, BLACK - (*Piper nigrum*), steam distilled fruit, Madagascar.

GALBANUM - (*Ferula galbaniflua*), steam distilled resin, Iran.

GINGER - (*Zingiber officinale*), steam distilled fresh root, Sri Lanka & Madagascar.

HYSSOP - (*Hyssopus decumbens*), steam distilled whole plant, Spain.

JUNIPER BERRY - (*Juniperus communis*), steam distilled berry, Bosnia.

LEMON - (*Citrus limon*), cold pressed fresh fruit peel, USA or Italy.

LIME - (*Citrus aurantifolia*), cold pressed fresh fruit peel, USA or Italy.

MYRRH - (*Commiphora myrrha*), steam distilled gum resin, Ethiopia or Kenya.

ORANGE, SWEET - (*Citrus sinensis*), cold pressed fresh fruit peel, USA, Italy, Portugal.

SPRUCE, BLACK - (*Picea Mariana*), steam distilled leaf, Canada.

TEA TREE - (*Melaleuca alternifolia*), steam distilled leaf, Australia.

TANGERINE - (*Citrus reticulata*), cold pressed fresh fruit peel, USA.

GRAPEFRUIT - (*Citrus paradisi*), cold pressed fresh fruit peel, USA.

MANDARIN - (*Citrus deliciosa*), cold pressed fresh fruit peel, USA.

NUTMEG - (*Myristica fragrans*), steam distilled or CO2 extracted fruit, Indonesia.

PINE - (*Pinus sylvestris*), steam distilled needles.

RAVENSARA - (*Ravensara aromatica*), steam distilled leaf, Madagascar.

ROSEWOOD - (*Aniba rosaeodora*), steam distilled wood, Brazil
(ICUN Red List Endangered Species).

GENERAL CAUTIONS (check each individual oil for more specific cautions): Monoterpene oils are the most volatile oils in aromatherapy and oxidize rapidly when exposed to heat, light and air. Avoid oxidized oils (recommend refrigeration). May be kidney and skin irritants.

2 - MONOTERPENOL – THE FEMALE ATHLETE

Based on their distinguishing qualities, each of the 12 chemical families can be divided into 12 Archetypes and their characteristic Elemental Powers.

These 12 archetypes, and their chemical families, tell us about the therapeutic properties, actions and effects of essential oils.

You can select essential oils to use alone, or in a formulation, to promote healing for specific conditions, based on their specific archetype and therapeutic chemical properties, actions and effects.

PLEASE NOTE: Depending upon the percentage(s) of a chemical component that comprises an oil, it can be classed in more than one chemical family.

As discussed in the last section of this book, Monoterpenes (are - terpenes). Refer to the Monoterpene – The Male Athlete to find out about monoterpenes and essential oils in this class of chemical compounds.

An alcohol added to a monoterpene chain is a monoterpene alcohol and often called a monoterpenol.

The same is true when adding an -OH (alcohol) group to a sesquiterpene. The family is called a sesquiterpenol.

Adding an additional oxidation pathway, such as with monoterpenols and sesquiterpenols, can lead to more synergistic effects. Something to keep in mind when concocting your blends.

Enhanced synergistic effects are a very important quality for an oil to have, as it boosts the effect of a single oil in its action, especially when in combination with other essential oils, botanical plants and extracts, or even when used with pharmaceutical agents.

Monoterpenols are a subclass of the Alcohol Family.

ARCHETYPE: The Female Athlete

ELEMENTAL POWER: Feminine (Yin character), promotes strength, stability, courage, endurance, stamina and agility.

MONOTERPENOL PROPERTIES

Essential oils rich in monoterpenols strengthen the immune system and are great for skin care. They promote emotional balance and calm nervous energy, anxiety and stress.

Monoterpenols are found in most essential oils. They have potent anti-infectious, antibacterial, antiviral properties and are generally nontoxic.

The most common monoterpenols in plants are:

Linalool - found in Rosewood (ICUN Red List Endangered Species) essential oil is very high in natural linalool at 82%-99. Linalool is also present in large amounts in Ho wood, Ho leaf, Coriander seed, Neroli, Basil (chemotype linalool), and Spike Lavender essential oils. Linalool contributes to the plants characteristic flavor and powerful floral scent.

A research study on, *Linalool, a plant-derived monoterpene alcohol*, published in PubMed, suggests that Linalool (LIN) may help in the management of breast cancer, especially in multiple drug resistant (MDR) tumors. The study noted that, **"a significant synergism was observed."**

Nerol - found in Neroli, Lemongrass and Melissa. Nerol gives the plant a sweet, fresh aroma. **A study showed** that Nerol (NEL) has great potential as an eco-friendly **antifungal agent** for food preservation.

Menthol - found in mint plants like Peppermint and Spearmint. It gives the plant a fresh, sweet, minty and cooling scent. Menthol relaxes intestinal muscles and prevents spasms.

A study on the effects of Menthol as an abortive treatment for migraine concluded that, "Menthol solution can be an efficacious, safe and tolerable therapeutic option for the abortive treatment of migraine."

Geraniol - found primarily in Lemongrass, rose oil, palmarosa and geraniums. It gives the plant a sweet rosy aroma and commonly used in perfumes.

A comprehensive research study on geraniol concluded that, "Geraniol represents a valuable asset against colitis alone or in combination with the conventional anti-colitic therapies," among other conditions studied. This study showed synergistic effects when geraniol was combined with traditional medical treatment interventions. In other words, results of treatment were enhanced when combined with geraniol.

Monoterpenol Actions & Effects:

Anti-infectious - controls infection.

Anti-viral - prevents, inhibits virus.

Anti-bacterial - prevents, inhibits bacteria.

Anti-fungal - prevents, inhibits fungal growth.

Analgesic - pain reliever.

Anti-inflammatory - reduces inflammation.

Immuno-stimulant - stimulates immune response, increases immune function.

Cicatrizant - skin and wound healing.

Carminative - prevents and treats gas in the intestines.

Regulator - stabilize and balance, especially mood and the emotions.

Essential Oils in this Class (partial list)

Preferred distillation method, part of plant used, and some best locations for production.

BASIL SWEET - (*Ocimum basilicum*), steam distilled leaf, Egypt.

PETITGRAIN - (*Citrus aurantium*), steam distilled leaf, Italy.

LAVENDER - (*Lavandula angustifolia*), steam distilled flowers (high altitude), Bulgaria & France.

PEPPERMINT - (*Mentha x piperita*), steam distilled flowers and leaf, USA.

SPKIE LAVENDER - (*Lavandula latifolia*), steam distilled flower, France & Spain.

TEA TREE - (*Melaleuca alternifolia*), steam distilled leaf, Australia.

LEMONGRASS - (*Cymbopogon citratus*), hydro-diffused gass, Haiti & India.

MARJORAM, SWEET - (*Origanum majorana*), steam distilled flower/leaf, Egypt.

PALMAROSA - (*Cymbopogon martinii*), steam distilled grass/herb, Nepal.

ROSE OTTO (*Rosa x damascena*), steam distilled flowers, Turkey & Bulgaria.

GERANIUM - (*Pelargonium roseum* & *P. graveolens*), steam distilled leaf, Reunion Islands, Madagascar & Albania.

CLARY SAGE - (*Salvia sclarea*), hydrodiffusion flowers, USA.

NEROLI (TRUE) - (*Citrus aurantium* L. ssp. *amara*), steam distilled blossoms, Tunisia.

GENERAL CAUTIONS (Check each individual oil for specific cautions): Can irritate the skin. Menthol containing essential oils like Peppermint should be avoided with children under 10 years of age.

3 - ESTERS – PROTECTORS & NURTURERS

Based on their distinguishing qualities, each of the 12 chemical families can be divided into 12 Archetypes and their characteristic Elemental Powers.

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You can select essential oils to use alone, or in a formulation, to promote healing for specific conditions, based on their specific archetype and therapeutic chemical properties, actions and effects.

PLEASE NOTE: Depending upon the percentage(s) of a chemical component that comprises an oil, it can be classed in more than one chemical family.

ARCHETYPE: Protectors & Nurturers

ELEMENTAL POWER: Mother, family, tribe and community.

ESTER PROPERTIES

Essential oils with esters are usually very fragrant with fruity notes. Their therapeutic actions and effects are characteristically sedating and antispasmodic. And, as with most essential oils, esters have a broad spectrum of anti-microbial action.

Esters are formed from alcohols and acids, and named after both their original molecules with the alcohols dropping the "ol" and gaining a "yl" and the acids dropping the "ic" and gaining an "ate."

An example of this transposition is linalyl acetate which is probably the most well-known ester and found in lavender, bergamot and clary sage. In most cases ester components are quite gentle and easy to use with little or no cautions.

Other examples of esters formed from alcohols and acids with this transposition are Benzyl benzoate found in Ylang Ylang oil and Geranyl acetate found in Geranium oil.

A research study on the effects of linalyl acetate for hypertension and stroke showed that linalyl acetate can be used as a tPA* to prevent hypertension-related ischemic injury from stroke. A 'tPA' is a systemic thrombolytic (clot-busting) agent and is used in the treatment of heart attack and stroke. Ischemic stroke is a leading cause of disability and mortality. Early delivery of a tPA - 3 to 4.5 hours after ischemic stroke onset, to patients that satisfy eligibility requirements to receive the treatment, has been demonstrated to reduce disability.*

Ester Actions & Effects:

Anti-fungal - destroys or inhibits growth of fungus.

Anti-inflammatory - alleviates inflammation.

Anti-spasmodic - prevents and eases spasms and relieves cramps.

Antiseptic - destroys, inhibits bacterial growth.

Relaxant - relaxing, soothing effect, causing relaxation, relieving strain or tension.

Nervine - calming to CNS, relieves tension, strengthens and tones nerves and nervous system.

Sedative - tranquilizing and sleep inducing.

Regulator - promotes balance and harmony

Calmative - a sedative.

Cicatrizant - skin, wound healing.

Tonic - especially nervous system.

Essential Oils in this class include:

Preferred distillation method, part of plant used, and some of best locations for production.

AMMI VISNAGA - (Ammi Visnaga), steam distilled herb, Morocco and Tunisia.

BERGAMOT - (Citrus bergamia), cold pressed peel (Linalyl acetate), Italy.

BIRCH* - (*Betula lenta*), steam distilled bark, Canada.

CARDAMON - (*Elettaria cardamomum*), hydro-diffused or steam distilled seed, Guatemala and India.

CHAMOMILE, ROMAN (*Anthemis nobilis*), steam distilled flowers, Bulgaria.

CISTUS - (*Cistus ladaniferus* - Rock Rose), steam distilled leaves/stalk, Spain.

CLARY SAGE - (*Salvia sclarea*), hydro-diffused flowers (Linalyl acetate), USA.

GERANIUM - (*Pelargonium graveolens*), steam distilled leaf (Geranyl acetate), Reunion Island Madagascar.

HELICHRYSUM - (*Helichrysum italicum* - Immortelle), steam distilled flowers, Corsica.

INULA - (*Inula graveolens*), steam distilled flowering herb, Corsica.

LAVENDER (*Lavandula angustifolia*), steam distilled flowers (Linalyl acetate), high altitude France and Bulgaria.

PETITGRAIN - (*Citrus aurantifolia*), steam distilled leaf, Italy.

YLANG YLANG - (*Cananga odorata*), steam distilled flowers (Benzyl benzoate), Madagascar.

*Birch oil is considered extremely toxic because of its high methyl salicylate content, which can be as high as 95-99%. Not only that but it's difficult to find pure, unadulterated distillations of Birch oil on the world market at this time.

GENERAL CAUTIONS (Please check each essential oil for more specific safety cautions): Avoid in pregnancy with babies and children. Generally gentle in action and free from toxicity except as noted above for Birch oil.

4 - LACTONES – SPIRITUAL DIRECTIONS

Based on their distinguishing qualities, each of the 12 chemical families can be divided into 12 Archetypes and their characteristic Elemental Powers.

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You can select essential oils to use alone, or in a formulation, to promote healing for specific conditions, based on their specific archetype and therapeutic chemical properties, actions and effects.

PLEASE NOTE: Depending upon the percentage(s) of a chemical component that comprises an oil, it can be classed in more than one chemical family.

ARCHETYPE: Spiritual Director

ELEMENTAL POWER: Motivate, Clarify, Inspire and Encourage

LACTONE PROPERTIES

Lactones may well be the most obscure chemical component in aromatherapy. Although Lactones are present in many plants, they are only found in small amounts in essential oils. Typically, Lactones are only found in cold pressed or expressed oils, and some absolutes, like jasmine. This is because their molecular weights are far too high for them to come through in the distillation of a plant.

Lactones are ‘cyclic’ esters in which the functional group of the ester has become part of a ringed structure with carbon atoms. They can be mono- or sesquiterpenoids. The cyclic nature of lactones lends a deepening and lasting quality to the protective and nurturing effect of plant esters.

The names of lactones are quite variable, though suffixes like, -olide, -in, -ine, -one and -lactone are fairly common.

Lactones contribute to the aroma of fruits, butter, cheese, and other foods. The scent that lactone contributes to a plant varies. Their fragrance

and flavor characteristics have been described from coconut, peach, prune and vanilla-like to creamy, musky and oily.

Even though the percentage of lactones present in essential oils may be very low, lactones are thought to play an especially important role as healing and clarifying agents in aromatherapy, Lactones' notable mucolytic, expectorant and fever-reducing actions, makes them especially effective for treating respiratory congestion and bronchitis.

Coumarins & Furocoumarins

A review on natural coumarin (a type of lactone) compounds for their pharmacological activity showed anti-inflammatory, antiallergic, antiviral, antimutagenic, and anticarcinogenic properties.

Coumarins act as anticoagulants (blood thinners) and hypotensors (lower blood pressure). Coumarins stimulate and uplift the senses, as well as have a calming and sedating effect.

Furocoumarins are found in Bergamot, Mandarin, Orange and Lemon.

Lactone Actions & Effects:

Mucolytic - breaks down mucous.

Expectorant - promotes secretion of the air passageways, especially good for treating coughs.

Anti-oxidant - removes potentially damaging oxidative agents, reduces oxidative stress.

Anti-coagulant - used to prevent formation of blood clots.

Anticoagulant - inhibits blood clotting, blood thinner.

Anti-pyretic - fever reducer.

Decongestant - relieves mucous congestion.

Anti-depressant - alleviates or prevents depression, lifts mood, counters melancholia.

Mild stimulant - quickens and enlivens the physiological functions of the body, temporarily increases body or organ function, good for convalescence, poor circulation, listlessness, physical fatigue.

Uplifting - morally or spiritually elevating, inspires happiness or hope.

Sedative - exerts a soothing, tranquilizing, calming effect on the body, good for nervous tension, stress, insomnia, anxiety, palpitations.

Hypotensor - lowers blood pressure.

Anti-viral (some are) - inhibits, destroys virus.

Anti-fungal (some are) - prevent, destroy fungal growth.

Essential Oils in this class include:

Preferred distillation method, part of plant used, and some of best locations for production.

BERGAMOT - (Citrus bergamia), cold pressed peel, Italy

LEMON - (Citrus limon), cold pressed fresh fruit peel, USA or Italy

SWEET ORANGE - (Citrus sinensis), cold pressed fresh fruit peel, USA or Portugal

CISTUS - (Cistus ladaniferus), steam distilled leaves/stalk, Spain

LIME - (Citrus aurantifolia), expressed, Mexico

GRAPEFRUIT - (Citrus paradisi), cold pressed fresh fruit peel, USA

GENERAL CAUTIONS (Check individual oils for specific cautions for each). Photosensitizing. Some coumarins, like furocoumarin found in bergamot oil, are severe sun skin sensitizers and application to the skin should be avoided before direct exposure to the sun or using a sunbed.

5 - OXIDES – THE LIBERATORS

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ARCHETYPE: The Liberators

ELEMENTAL POWER: Create Openness & Freedom

OXIDE PROPERTIES

The most common oxide in aromatherapy is 1,8-cineole. Also known by a number of synonyms like eucalyptol and cajuputol.

Oxide molecules are chemically very stable and found in many essential oils. They have an oxygen atom within a ring structure and are usually made from an alcohol. They are named after the alcohol with the ending being oxide, i.e. linalool oxide.

Essential oils having a camphoraceous scent usually contain oxide formations, i.e. eucalyptus (the eucalyptol content is highest in the smithii variety than in other eucalyptus oils), rosemary cineole and cajeput.

1,8-Cineole has been shown to have expectorant properties and to stimulate the respiratory and digestive systems.

A study published in PubMed showed the [anti-anxiety effects of 1,8-Cineole](#) on Preoperative Anxiety.

Another PubMed study showed **anti-inflammatory effects of 1,8-Cineole** when used as co-medication in inflammatory airway diseases.

It was concluded in another study that use of **1,8-cineole correlates with improved cognitive performance** following exposure to the aroma of rosemary

Oxide Fragrance Chemicals found in Essential Oils:

Cineole

Rose oxide

Linalool oxide

Sclareol oxide

Pinene oxide

Oxide Actions & Effects:

Mild stimulant - an agent that quickens the physiological functions of the body, temporarily increases body or organ function, good for convalescence, poor circulation, listlessness, physical fatigue.

Anti-anxiety - relieves anxiety.

Anti-inflammatory - calming and soothing, reduces inflammation.

Tonic - strengthens and enlivens the whole or specific parts of the body.

Rubefacient - warming, agent which reddens skin, dilates vessels increase blood flow.

Decongestant - relieves or reduces congestion, inflammation.

Expectorant - helps promote removal of mucus from respiratory system, stimulates the action of decongestion for the entire body, heals respiratory system.

Anti-viral - controls, inhibits viral organisms and infections, destroys virus.

Insecticide - insect repellent.

Mental stimulant - increases mental function.

Essential Oils in this class include:

Preferred distillation method, part of plant used, and some of best locations for production.

EUCALYPTUS - (Eucalyptus smithii, globulus & radiata), steam distilled leaf, Australia.

NIAOULI - (Melaleuca quinquenervia), steam distilled leaf, Madagascar.

CHAMOMILE GERMAN - (Matricaria recutita), steam distilled flowers, Bulgaria.

ROSEMARY ct. CINEOLE - (Rosmarinus officinalis), steam distilled, Morocco.

RAVINTSARA - (Cinnamomum camphora), steam distilled leaf, Madagascar.

SPIKE LAVENDER - (Lavandula latifolia), steam distilled flower, France.

MYRTLE - (Myrtys communis), steam distilled leaf/fruit, Morocco.

BAY LAUREL - (Laurus nobilis), steam distilled leaf, Jamaica.

CAJUPUT - (Melaleuca leucadendron), steam distilled leaf, Australia.

HYSSOP - (Hyssopus decumbens), steam distilled whole plant, Spain.

ROSEWOOD - (Aniba rosaeodora), steam distilled wood, Brazil (endangered).

INULA - (Inula graveolens), steam distilled flowering herb, Corsica.

GENERAL CAUTIONS (Please check each essential oil for more specific safety cautions). Skin irritant. Maximum dermal use level is less than 2% to avoid skin sensitization. Use caution when using with those with breathing issues like asthmatics. Avoid use with children under age 10.

6 - PHENOLS – THE WARRIORS

Based on their distinguishing qualities, each of the 12 chemical families can be divided into 12 Archetypes and their characteristic Elemental Powers.

These 12 archetypes, and their chemical families, tell us about the therapeutic properties, actions and effects of essential oils.

You can select essential oils to use alone, or in a formulation, to promote healing for specific conditions, based on their specific archetype and therapeutic chemical properties, actions and effects.

PLEASE NOTE: Depending upon the percentage(s) of a chemical component that comprises an oil, it can be classed in more than one chemical family.

ARCHETYPE: The Warriors

ELEMENTAL POWER: Aggressive, Powerful Defender

PHENOL PROPERTIES

Phenol is an aromatic organic compound that consists of a phenyl group ($-C_6H_5$) bonded to a hydroxy group ($-OH$). Phenols appear superficially similar to alcohols, possessing an $-OH$ group, but in practice they are quite different. The names of phenols end in -ol, i.e. carvacrol. In phenols the $-OH$ group is attached to an aromatic ring or phenyl ring.

Phenols require careful handling due to their tendency to cause chemical burns. They have a viscous (thick, sticky) consistency. Their high viscosity makes them less volatile and slows evaporation. In fact, phenols evaporate more slowly than water. Phenol's characteristic scent is intensely sweet.

Phenol may well have been the first surgical antiseptic. In 1865 the British surgeon Joseph Lister, used phenol as an antiseptic to sterilize his operating field. Use of phenol in surgical amputations reduced the death rate from amputations from 45 to 15 percent in Lister's ward.

Thymol, eugenol and carvacrol are characteristic components of these essential oils with strongly antiseptic, anti-bacterial, disinfectant and stimulating properties.

Thymol - Results of a study on the chemical Thymol (a constituent of the essential oil Thymus vulgaris) suggest the potential role of thymol as a natural immuno-stimulatory drug which can be used in the treatment of various immunological disorders.

Eugenol - The influence of clove essential oil in antimicrobial activity was studied. The results of the study suggest that the characteristics of organic substances, i.e. eugenol, play an important role in destroying bacteria. Up to 89% of clove oil is eugenol.

Carvacrol - The biological effects of carvacrol was studied (oregano essential oil contains up to 80% carvacrol). It's antimicrobial, antioxidant, antifungal, immunomodulatory, anticancer and anti-inflammatory properties were shown to prevent free radicals and hazardous compounds from interacting with cellular DNA. Carvacrol has the ability to change the gut microflora, improving digestion and absorption of nutrients.

Phenol Actions & Effects

Anti-infectious - Counteracts infection, used in acute illnesses and infections.

Analgesic - pain reliever.

Anti-inflammatory - controls, alleviates inflammation resulting from injury or infection.

Antiseptic - prevents, halts infection.

Antibacterial - destroys or stops growth of bacteria.

Anti-infectious - counteracts infection.

Disinfectant - destroys bacteria.

Stimulant - quickens the physiological functions of the body, temporarily increases body or organ function, good for convalescence, poor circulation, listlessness, physical fatigue, especially stimulating to

central nervous & immune systems, activates the body's own healing mechanism.

Tonic - strengthens and enlivens the whole or specific parts of the body.

Rubefacient - warming, agent which reddens skin, dilates vessels, increases blood flow.

Astringent - drying, causes contraction of organic tissues.

Essential Oils in the Class include:

Preferred distillation method, part of plant used, and some best locations for production.

ANNISE SEED Phenolic Ether - (*Pimpinella anisum*), steam distilled seed, Egypt.

CINNAMON Phenolic Ether - (*Cinnamomum zeylanicum*), steam distilled leaf, water distillation bark, Madagascar.

CLOVE BUD Phenolic Ether - (*Eugenia caryophyllata*), steam distilled bud, Madagascar.

FENNEL SWEET & BITTER Phenolic Ether/Phenol - (*Foeniculum vulgare*), steam distilled seed, Egypt.

GINGER Phenol - (*Zingiber officinale*), hydro-diffused fresh root.

OREGANO Phenolic Ester - (*Origanum vulgare*), steam distilled herb, Turkey.

THYME Phenol - (*Thymus vulgaris*), steam distilled herb, Germany.

Essential oils high in phenols should always be used in very low concentrations (less than 1%) and for short durations of time, as they can lead to toxicity. Phenols are skin and mucus membrane irritants and can cause severe skin reactions.

GENERAL CAUTIONS (Please check each essential oil for more specific safety cautions).: Skin irritant, Hepatotoxic, Nephrotoxic.

7 - ALCOHOLS – THE LOVERS

Based on their distinguishing qualities, each of the 12 chemical families can be divided into 12 Archetypes and their characteristic Elemental Powers.

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PLEASE NOTE: Depending upon the percentage(s) of a chemical component that comprises an oil, it can be classed in more than one chemical family.

ARCHETYPE: The Lovers

ELEMENTAL POWER: Incite Passion & Enthusiasm

ALCOHOL PROPERTIES

Some of the most well-known and beloved essential oils in aromatherapy are in the alcohol chemical class. Alcohols are friendly oils that blend well with most other essential oils.

Alcohols are a varied group of terpene essential oils. Like phenols, they are a hydroxyl functional group. Meaning, they contain oxygen bonded to hydrogen.

All alcohols always end in -ol. Monoterpene alcohols are found in a large number of essential oils. Whereas, sesquiterpene alcohols occur only in a few essential oils.

Adding an additional oxidation pathway, such as with monoterpenols and sesquiterpenols, can lead to more synergistic effects. A synergistic effect is observed when the combination of substances is greater than the sum of the individual effects.

The synergistic quality of alcohols is what makes them stand out and worthy of being in a class of their own.

The synergistic effect of alcohols is why I call this class of oils “The Lovers” of aromatherapy. There’s a characteristic quality to these oils that makes them suitable for blending with most other essential oils. Their synergistic quality enhances any blend’s healing properties, actions and effects.

The scent of alcohol containing oils varies from balsamic and herbal to fruity and floral.

Essential oils containing terpene alcohols have the highest antibacterial action, after phenols and aldehydes.

Alcohols are generally nontoxic, non-irritating, nonallergenic and nonmutagenic (do not cause cell mutations or genetic alterations).

Monoterpene alcohols (monoterpenols) are good antiseptics and anti fungal agents.

There has been **considerable research on Rose Otto**, one of the most legendary monoterpenols, as a healing agent. One such study, **shows Rose essential oil’s activity** as hypnotic, antioxidant, antimicrobial, analgesic, anti-convulsive, anti-inflammatory and anti-depressant.

East Indian Sandalwood Oil is a sesquiterpenol renowned for its use as a therapeutic healing agent since antiquity. Numerous research studies have been conducted showing Sandalwood’s effective use for many different conditions.

One study shows, East Indian Sandalwood Oil (EISO) 'Alleviates Inflammatory and Proliferative Pathologies of Psoriasis.' These clinical findings indicate that the healing responses are due to EISO’s anti-inflammatory properties.

Alcohol Actions & Effects

Anti-depressant - used to alleviate depression.

Anti-infectious - prevents infection.

Analgesic - pain reliever.

Rubefacient - Warming, agent which reddens skin, dilates vessels increase blood flow.

Cicatrizant - skin and wound healing.

Antiviral - prevents/inhibits viral activity.

Anti-inflammatory - reduces inflammation, pain and swelling.

Anti fungal - prevents/inhibits fungal infection.

Antiseptic - inhibits and destroys microorganisms.

Bactericidal - prevents, kills bacteria.

Tonic - strengthens and enlivens the whole or specific parts of the body.

Immune stimulant - stimulates immune function.

Regulator - stabilizing, promotes balance and harmony.

Stimulant - quickens the physiological functions of the body, temporarily increases body or organ function, cleansing effect on liver and hormonal systems.

Relaxant - relaxing, soothing, calming effect, relieves strain or tension.

Essential Oils in this class include:

Preferred distillation method, part of plant used, and some of best locations for production.

ROSE OTTO - (Rosa x damascena), steam distilled flowers, Turkey or Bulgaria - Monoterpenol.

NEROLI - (Citrus aurantium var amara), steam distilled blossoms, Tunisia - Monoterpenol.

GERANIUM ROSE - (Pelargonium roseum), steam distilled leaf, Reunion Islands, Madagascar or Albania - Monoterpenol.

CYPRESS - (Cupressus sempervirens), steam distilled leaf, Crete, Mediterranean region.

JUNIPERBERRY - (Juniperus communis), steam distilled berry, Bosnia - Monoterpenol.

PEPPERMINT - (*Mentha x piperita*), steam distilled flowering tops, USA - Monoterpenol.

SWEET MARJORAM - (*Origanum majorana*), steam distilled flowers and leaf, Egypt - Monoterpenol.

PALMAROSA - (*Cymbopogon martinii*), steam or hydro distilled grass, Nepal - Monoterpenol.

MYRTLE - (*Myrtys communis*), steam distilled leaf, Morocco - Monoterpenol.

ROSEWOOD - (*Aniba rosaeodora*), steam distilled wood, Brazil (endangered) - Monoterpenol. (ICUN Red List Endangered Species).

BERGAMOT - (*Citrus bergamia*), cold pressed peel, Italy - Monoterpenol.

CORIANDER - (*Coriandrum sativum*), steam distilled seed, USA - Monoterpenol.

TEA TREE - (*Melaleuca alternifolia*), steam distilled leaf, Australia - Monoterpenol.

CARROT SEED - (*Daucus carota*), steam distilled seed, France - Sesquiterpenol.

CHAMOMILE GERMAN - (*Matricaria chamomila*), steam distilled flowers, Bulgaria - Sesquiterpenol.

PATCHOULI - (*Pogostemon cablin*), steam distilled leaf, Indonesia - Sesquiterpenol.

VETIVER - (*Vetiveria zizanioides*), hydro-diffused grass, Haiti - Sesquiterpenol.

SANDALWOOD - (*Santalum album*), steam distilled heartwood, India - Sesquiterpenol (ICUN Red List Endangered Species).

SPIKENARD - (*Nardostachys jatamansi*), steam distilled, Indonesia - Sesquiterpenol (ICUN Red List Endangered Species).

CEDARWOOD ATLAS - (*Cedrus atlantica*), steam distilled wood, Morocco - Sesquiterpenol (ICUN Red List Endangered Species).

CEDARWOOD HIMALAYAN - (*Cedrus deodora*), steam distilled wood, Nepal - Sesquiterpenol.

GENERAL CAUTIONS (Please check each essential oil for more specific safety cautions): None, generally nontoxic and non-irritating to the skin.

8 - ALDEHYDES – THE CLEANERS

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Aldehydes - Archetype: The Cleaners

ELEMENTAL POWER

Renew & Freshen

ALDEHYDE PROPERTIES

Aldehydes are organic aromatic compounds with an oxygen atom double bonded to a carbon and designated as $C=O$.

Highly unstable, aldehydes easily oxidize and become rancid in the presence of heat, light and air.

Citral, neral, geranial and citronellas are characteristic components of aldehyde containing essential oils. Essential oils containing primarily aldehydes have the highest antibacterial activity, [along with phenols.](#)

Citral is an aroma compound used frequently in the perfume industry for its citrus effect. It's also used as a food flavor and to fortify the effects of lemon oil.

Citral has strong antimicrobial qualities, and frequently used as an insecticide. It is also a great fat burner and excellent for promoting weight loss. Citral is often used for making weight loss medications.

Lemongrass oil contains 70–80 percent citral.

Citral has been studied and **shown to be effective for its bactericidal** and fungicidal activity.

Neral, is an isomer of citral, meaning it has the same chemical formula as citral, but in a different arrangement and somewhat different properties. Neral is classified as a monoterpene aldehyde. Its aroma is similar to lemons.

Neral has been studied and shown effective as an antibacterial agent. One study showed the **antimicrobial prosperities of Lemongrass (Cymbopogon citratus)** to be effective against pathogenic bacteria in pet turtles.

Citronellal has a distinctive lemon scent.

Research on its insect properties show its **high effectiveness, especially against mosquitoes**. Research has also demonstrated citronellal's strong anti fungal properties.

Geranial has a light, sharp, fresh lemon scent. Studies conducted on the aldehydes geranial (alpha citral) and neral (beta citral) **showed both to be effective as antibacterial agents**. The study also showed their potentiating effect when mixed with myrcene.

Aldehyde Actions & Effects

Anti-viral - inhibits and controls viral activity, destroys virus.

Antibiotic - inhibits growth, destroys micro organisms.

Anti-bacterial - inhibits bacterial growth.

Anti-spasmodic - controls, alleviates inflammation resulting from injury or infection.

Anti-inflammatory - reduces inflammation.

Anti-parasitic - destroys parasites.

Anti-fungal - destroys, inhibits growth of fungus.

Disinfectant - inhibits, destroys bacteria.

Essential Oils in this class include:

Preferred distillation method, part of plant used, and some of best locations for production.

BASIL LEMON - (*Ocimum citriodorum*), steam distilled leaf, USA.

LEMONGRASS - (*Cymbopogon citratus*), steam distilled grass, India.

LEMON VERBENA - (*Lippia citriodora*), steam distilled leaf, France.

EUCALYPTUS LEMON - (*Eucalyptus citriodora*), hydro-diffused leaf, Australia

MELISSA - (*Melissa officinalis*), steam distilled flower/leaf, France.

CITRONELLA - (*Cymbopogon winterianus*), steam distilled Grass, Indonesia.

ORANGE SWEET - (*Citrus sinensis*), cold pressed fresh peel, Portugal.

MANDARIN - (*Citrus deliciosa*), cold pressed fresh peel, Italy.

LIME - (*Citrus aurantifolia*), cold pressed fresh peel, Brazil.

CITRONELLA - (*Cymbopogon winterianus*) steam distilled grass, Indonesia.

CINNAMON BARK - (*Cinnamomum zeylanicum*), steam distilled bark, Ceylon.

GERANIUM - (*Pelargonium graveolens* & *P. roseum*), steam distilled leaf, Reunion Islands, Madagascar or Albania.

TEA TREE LEMON - (*Leptospermum petersonii*), steam distilled leaf, Australia.

GENERAL CAUTIONS (Please check each essential oil for more specific safety cautions). Strong skin irritant and skin sensitivity. Use in weak dilutions of 1% or less. Careful storage is recommended, as aldehydes have a quicker oxidative rate, recommend refrigeration.

9 - ETHERS - THE TRANSFORMERS

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ARCHETYPE: The Transformers

ELEMENTAL POWER: Clear & Restore

ETHER (Phenylpropanoids) PROPERTIES

Ethers rarely occur alone in essential oils. Phenolic ethers are the most commonly found ethers in essential oils.

Ethers contain an ether group - an oxygen atom connected to two alkyl or aryl groups. They have the general formula $R-O-R'$, where R and R' represent the alkyl or aryl groups. Ethers are classified into two types: Simple or Symmetrical and Mixed or Unsymmetrical, depending if the groups are the same on each side of the oxygen atom, or mixed.

Characteristic aromas of ethers are anise-like, citrusy, herbaceous, spicy, sweet, and woody.

Common Ethers

Anethole - Anise and Fennel.

Anethole (also known as **anise camphor**) is widely used as a flavoring substance. It is a derivative of phenylpropene, a type of aromatic compound that occurs widely in nature and in essential oils. It

contributes a large component of the odor and flavor of anise and fennel (both in the botanical family Apiaceae).

Estragole - Sweet fennel.

Closely related to anethole, estragole is abundant in tarragon (Asteraceae) and basil (Lamiaceae), and has a flavor reminiscent of anise.

Research studies show that anethole is a slightly more effective pesticide than DEET. Anisaldehyde, a related natural compound, that occurs with anethole and in many essential oils, is 14 times more effective. The results of the **study suggest that anethole and estragole derived from anise seeds** are useful for the development of new agents to control food mites.

Methyleugenol - Holy Basil

A study was conducted on the aromatic profiles of five Basil essential oils, including Holy Basil, by food researchers. The researchers were focused on the search for natural products that could replace chemically synthesized food additives, as there has been an increasing concern regarding health problems associated with synthetic food flavoring agents. It was concluded that future research could be extended to use natural products from these plant species as active additives against food microbials and in agriculture as a bio-control agent.

Myristicin - Nutmeg

Myristicin is found in highest concentrations in nutmeg oil. It is primarily used as a food flavoring agent. Studies have shown it to produce psychoactive responses (in higher doses than used for cooking) and significant insecticidal activity.

Ether Actions & Effects

Antiseptic - prevents, halts infection.

Antispasmodic - relieves involuntary muscle spasms.

Spasmolytic - calms nervous and muscular spasms, for colic, pain and indigestion.

Digestive - promotes or aids digestion of food.

Carminative - helpful for relief of gas, bloating and nausea.

Insecticide - substances used to kill insects.

Psychoactive (at high doses) - affecting the mind, used for altering the mood and perception.

Essential Oils in this Class

Preferred distillation method, part of plant used, and some best locations for production.

ANNISE SEED - Phenolic Ether - (*Pimpinella anisum*), steam distilled seed, Egypt.

FENNEL SWEET - Phenolic Ether - (*Foeniculum vulgare*), steam distilled seed, Egypt.

BASIL - Phenolic Ether - (Basil oil, ct. methyl chavicol), steam distilled leaf, USA.

ROSEMARY CINEOLE - (*Rosmarinus officinalis*), steam distilled leaf, Morocco.

NUTMEG - (*Myristica fragrans*), steam distilled seed, Indonesia.

DILL - (*Anethum graveolens*), steam distilled weed, USA & India.

PARSLEY - (*Petroselinum sativum*), steam distilled seed, Indonesia.

GENERAL CAUTIONS (Please check each individual oil for specific cautions): Use with care in low doses of 1% or less for short durations. Avoid in pregnancy and breast-feeding. Possible safety issues include liver toxicity, estrogen-like activity, neurotoxic effects, psychotropic, and genotoxicity (interferes with DNA).

10 - KETONES – THE SERVICE WORKERS

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ARCHETYPE: The Service Workers

ELEMENTAL POWER: Can Do

KETONE PROPERTIES

Menthone, carvone, camphor, and p-vetivone are some of the characteristic components of ketone containing essential oils.

Essential oils containing a significant percentage of ketones are especially valuable for respiratory infections and are effective mucolytic and expectorant agents.

Menthone - a monoterpene ketone, menthone is a constituent of the essential oils of peppermint and spearmint, among others. Structurally menthone is related to menthol. Its characteristic aroma is minty and fresh.

Carvone - a terpene ketone, carvone is an important monoterpene ketone for the flavor industry. L-carvone, has a sweetish minty smell, like spearmint leaves. While D-carvone is the main component of caraway oil and dill, and has an aroma resembling these herbs.

Camphor - A bicyclic monoterpene ketone, camphor is found widely in plants and contained in Peppermint, Blue Yarrow, Rosemary, among others. Its characteristic aroma is camphoraceous.

***p*-vetivone** - another terpene ketone, *p*-vetivone is one of the major constituents in vetiver oil that gives it its characteristic aroma. The scent of vetiver is sweet, smooth, delicate, mysterious, woody, rich and deep.

Ketones and aldehydes are similar in that both contain carbonyl groups. A carbonyl group is composed of a carbon atom double-bonded to an oxygen atom: $C=O$

The carbonyl carbon is connected to C or H atoms on either side.

An aldehyde has one or both vacancies of the carbonyl carbon group satisfied by an H atom, while a ketone has both its vacancies satisfied by carbon.

So, if there's a hydrogen atom attached to one or both side of the carbonyl group it's an aldehyde. The hydrogen atom makes for instability and rapid oxidation of an aldehyde essential oil.

Whereas, ketone containing oils are relatively stable and not easily oxidized.

A broad systemic review of studies that have been conducted on Rosemary (*Rosmarinus officinalis*) was assessed. The study was intended to promote the development and expansion of plant-based medicine (PBM). Since 1990 more than 286 studies have been published on Rosemary's pharmacological activity.

The study reported that only about 10% of 250,000 species of plants worldwide have been scientifically studied with potential use in healthcare. An estimated 60,000 of those species will probably become extinct by the year of 2050.

The study concluded, "*R. officinalis* has a promising future in the medical field, especially in the treatment and prevention of various cancers, infectious diseases and increasingly emerging diseases such as depression, Alzheimer's and Parkinson's diseases."

Ketone Actions & Effects

Anti-oxidant - inhibits potentially damaging oxidation.

Anti-infectious - controls, inhibits spread of infections.

Cicatrizant - skin healing and regenerating skin regeneration, wound healing and reducing old scar tissue such as in wounds, stretch marks and adhesions.

Digestive - aids, promotes digestion.

Expectorant - promotes secretion of mucous from air passageways, used to treat coughs.

Mucolytic - dissolves mucous, especially respiratory and uro-genital

Lipolytic - breaks down fats.

Stimulant (in large amounts) - quickens the physiological functions of the body, temporarily increases body or organ function, good for convalescence, poor circulation, listlessness, physical fatigue.

Tonic - invigorating, giving feeling of well being.

Sedative - promotes calm, induces sleep.

Analgesic (some are) - pain reliever.

Anti-coagulant (some are) - inhibits blood clotting.

Essential Oils in this class include:

Preferred distillation method, part of plant used, and some of best locations for production.

HYSSOP - (*Hyssopus officinalis*), steam distilled whole plant, Bulgaria.

ROSEMARY ct. CAMPHOR (*Rosmarinus officinalis*), steam distilled leaf, Spain.

ROSEMARY ct. VERBENON (*Rosmarinus officinalis*), steam distilled leaf, Corsica & Italy.

SPEARMINT - (*Mentha x spicata*), steam distilled flowering herb, USA.

PEPPERMINT - (*Mentha x piperita*), steam distilled flower tops, USA.

TANSY, BLUE - (*Tanacetum annuum*), steam distilled flowering tops, Morocco.

YARROW, BLUE - (*Achillea millefolium*), steam distilled flowers, Bulgaria.

DILL OIL - (*Anethum graveolens*), steam distilled seed, India.

CARRAWAY - (*Carum carvi*), steam distilled seed, Egypt.

SPIKE LAVENDER - (*Lavandula latifolia*), steam distilled flowers, Spain & France.

GENERAL CAUTIONS (Please check each essential oil for more specific safety cautions): Neurotoxic. Short-term use of low dilutions of 1% or less are considered safe. Essential oils high in ketones need to be used with care in pregnancy.

11 – SESQUITERPENES – THE GRANDFATHERS

Based on their distinguishing qualities, each of the 12 chemical families can be divided into 12 Archetypes and their characteristic Elemental Powers.

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ARCHETYPE: Wise Elders and Compassionate Ones

ELEMENTAL POWER: Masculine Power, Grandfathers, Guardians, Teachers, Ground, Soothe & Comfort

SESQUITERPENE PROPERTIES

Found most often in higher plants, sesquiterpenes are a class of terpenic hydrocarbons and, as with their cousins the monoterpenes, end with -ene.

Sesquiterpenes are less volatile than terpenes, given their 15-carbon structure, and have a greater potential for chemical diversity and a stronger aroma.

Only a few sesquiterpenes are volatile – they are azulenes, such as chamazulene, bisabolol and farnesene.

Essential oils containing a significant percentage of sesquiterpenes are especially prized in aromatherapy for their anti-inflammatory and bactericidal properties.

Recent research and development of new drugs derived from natural plant-based products has led to identification of several sesquiterpenes

with promising anti-inflammatory, anti-parasitic and anti-carcinogenic activities.

Sesquiterpenes can be monocyclic, bicyclic or tricyclic and are a very diverse group; there are 22 types. Examples include:

Chamazulene - one of the most anti-inflammatory of sesquiterpene containing oils, chamazulene, only has 14 carbon atoms but is usually included with sesquiterpene oils. Chamazulene gives Chamomile its vivid, deep blue color. Its aroma is sweet, fruity and herbaceous.

Caryophyllene (or β -**Caryophyllene**) - is a spicy, peppery terpene found in many different edible plants. While it is often mentioned as a terpene found in cannabis, beta-caryophyllene (BCP) is one of more than 30,000 terpenes found in nature. It is found in basil, oregano, lavender, rosemary, cinnamon, ylang ylang, and clove.

Both chamazulene and caryophyllene have strong antioxidant and antitumor activity.

Farnesene - is found in a variety of essential oils, including ginger, ylang ylang, hops and German chamomile.

Farnesene is known to have anti-inflammatory, calming, antispasmodic, antibacterial, anti-fungal, and sedative properties. Often used as a flavoring agent, farnesene has a woody, citrus, floral and herbal aroma.

Terpinolene - Terpinolene is the terpene responsible in-part for the woody, piney smell of cannabis, accompanied by citrusy and floral notes. Terpinolene is found in tea tree, conifers, apple, cumin, sage, rosemary and lilac. The highest percentage of terpinolene is found in parsnip oil at 40.3–69.0%, followed by Douglas Fir at 9.1%, Mexican Lime at 8.1–8.7% and Australian Lemon balm at 6.6%.

Terpinolene is used for scenting soaps and perfumes and some insect repellents. It has been studied for its anti-fungal and antibacterial properties, as well as for its mild sedative action. Terpinolene exhibits a synergistic effect when combined with other essential oils.

A few studies report Terpinolene's sedative action as a natural insomnia remedy. Terpinolene also exhibits mild depressant (anxiolytic)

action on the central nervous, suggesting its usefulness for reducing anxiety.

Sesquiterpene Actions & Effects

Anti-allergic - preventing and halting allergic reactions.

Anti-inflammatory - alleviates inflammation.

Antispasmodic - prevents and eases spasm and relieves cramps.

Analgesic - pain reliever.

Antiseptic - prevent, halt growth micro organisms.

Anti-oxidant - inhibits oxidation, counteracts deterioration of a product.

Anti-bacterial - inhibits, halts growth of bacteria.

Anti-microbial - inhibits and destroys microbial growth.

Calmative - having a sedative effect.

Cicatrissant - skin and wound healing, promotes formation of scar tissue.

Relaxant - relaxing, soothing effect, causing relaxation, relieving strain or tension.

Regulator - stabilizing, promotes balance and harmony.

Sedative - calming.

Essential Oils in this class (partial list)

Preferred distillation method, part of plant used, and some best locations for production.

BLUE TANSY - (Tanacetum anuum), steam distilled flower tops, Morocco.

CHAMOMILE, GERMAN - (Matricaria recutita), steam distilled flowers, Bulgaria.

CHAMOMILE, ROMAN - (Anthemis noblis), steam distilled flowers, USA.

CEDARWOOD, ATLAS - (*Cedrus atlantica*), steam distilled wood, Morocco (ICUN Red List Endangered Species).

CEDARWOOD, HIMALAYAN - (*Cedrus deodora*), steam distilled wood, Nepal.

EUCALYPTUS - (*Eucalyptus globulus*), steam distilled leaf, Australia.

GINGER, FRESH ROOT - (*Zingiber officinale*), steam distilled root Madagascar or Sri Lanka.

HELICHRYSUM - (*Helichrysum italicum*), steam distilled flowers, Corsica.

HYSSOP - (*Hyssopus decumbens*), steam distilled whole plant, Spain.

MYRRH - (*Commiphora myrrha*), steam distilled gum resin, Ethiopia or Kenya.

PATCHOULI - (*Pogostemon cablin*), steam distilled leaf, India.

PEPPER, BLACK - (*Piper nigrum*), steam distilled seed, Madagascar.

SANDALWOOD - (*Santalum album*), steam distilled heartwood, India. (ICUN Red List Endangered Species).

SPIKENARD - (*Nardostachys jatamansi*), steam distilled wild root, Nepal (ICUN Red List Endangered).

YARROW, BLUE - (*Achillea millefolium*), steam distilled flowers, Bulgaria.

YLANG YLANG - (*Cananga odorata*), steam distilled flowers, Madagascar.

VALERIAN - (*Valerian officinalis*), steam distilled root, India.

VETIVER - (*Vetiveria zizanioides*), hydro-diffused root, Haiti.

GENERAL CAUTIONS (Please check each individual oil for more specific cautions). Generally nontoxic. Some may be skin irritants.

12 - SESQUITERPENOLS – THE GRANDMOTHERS

Based on their distinguishing qualities, each of the 12 chemical families can be divided into 12 Archetypes and their characteristic Elemental Powers.

These 12 archetypes, and their chemical families, tell us about the therapeutic properties, actions and effects of essential oils.

You can select essential oils to use alone, or in a formulation, to promote healing for specific conditions, based on their specific archetype and therapeutic chemical properties, actions and effects.

PLEASE NOTE: Depending upon the percentage(s) of a chemical component that comprises an oil, it can be classed in more than one chemical family.

Sesquiterpenols are a subclass of alcohols.

ARCHETYPE: - Wise Elders & Compassionate Ones

ELEMENTAL POWER: Grand Mothers, Guardians, Teachers, Ground, Soothe & Comfort

SESQUITERPENOL PROPERTIES

A naturally occurring 15-carbon organic compound similar to sesquiterpene structure, but with an added alcohol group.

When adding an -OH (alcohol) group to a sesquiterpene the family is called a sesquiterpenol. Adding an additional oxidation pathway can lead to more synergistic effects.

Enhanced synergistic effects acts to boost the effect of a single oil in its action, especially when in combination with other essential oils, botanical plants and extracts, or even when used with pharmaceutical agents.

Sesquiterpene alcohols are not commonly found in essential oils, but when present, offer outstanding healing effects.

A study on the effects of sesquiterpenol reported that an extract of sesquiterpenol potently suppresses inflammation in macrophages (white blood cells) and mice skin and prevents chronic liver damage.

Types of sesquiterpene alcohols include:

a-Santalol (alpha santalol) - is found abundantly in East Indian Sandalwood oil (55-70+%). **A study on the effects of inhalation of Sandalwood oil** on the emotional behavior of mice showed that sandalwood is responsible for sedative effects in mice. Alpha santalol has a smooth, sweet, richly woody scent.

α -Bisabolol (alpha bisabolol) - is a sesquiterpene alcohol found abundantly in chamomile essential oil. Bisabolol is a cannabis terpene with a delicately sweet and floral aroma and with subtle hints of citrus and spice.

Studies showed alpha bisabolol was effective for decreasing intense inflammation due to Acute Respiratory Distress Syndrome (ARDS), a severe clinical condition of the respiratory system with different causes.

Farnesol - a natural sesquiterpene alcohol in essential oils, was found to have potential for alleviating massive inflammation, oxidative stress and lung injury. Found in rose, tuberose and neroli. Farnesol has a soft, light and floral aroma with subtle woody notes.

Sesquiterpenol Actions & Effects

Anti-inflammatory - alleviates inflammation.

Antispasmodic - prevents and eases spasm and relieves cramps.

Analgesic - pain reliever.

Anti-allergic - prevents, halts allergic reactions.

Anti-oxidant - inhibits oxidation and free radical damage.

Anxiolytic - promotes relief of anxiety.

Cicatrizant - skin and wound healing, promotes formation of scar tissue.

Regulator - stabilizing, promotes balance and harmony.

Relaxant - relaxing, soothing effect, causing relaxation, relieving strain or tension.

Sedative - calming.

Stimulant (liver & glandular) - quickens the physiological functions of the body, temporarily increases body or organ function, cleansing effect on liver and hormonal systems.

Essential Oils in this Class (partial list)

Preferred distillation method, part of plant used, and some best locations for production.

CHAMOMILE, GERMAN - (*Matricaria recutita*), steam distilled flowers, Bulgaria.

CARROT SEED - (*Daucus carota*), hydrodiffusion seeds, France.

PATCHOULI - (*Pogostemon cablin*), steam distilled leaf, India.

GINGER - (*Zingiber officinale*), steam distilled fresh root, Madagascar.

HELICHRYSUM - (*Helichrysum italicum* - Everlasting Immortelle), Steam distilled flowers, Corsica.

NEROLI - (*Citrus aurantium* ssp. *amara*), Steam distilled flower blossoms, Tunisia.

ROSE OTTO - (*Rosa damascena*), Steam distilled flower blossoms, Bulgaria & Turkey.

SPIKENARD - (*Nardostachys jatamansi*), steam distilled wild root, Nepal (ICUN Red List Endangered Species).

SANDALWOOD - (*Santalum album*), steam distilled heartwood, India. (ICUN Red List Endangered Species).

VALERIAN - (*Valerian officinalis*), steam distilled root, India.

VETIVER - (*Vetiveria zizanioides*), hydro-diffused root, Haiti.

GENERAL CAUTIONS (Please check each individual oil for more specific cautions): None known.

Recommended Reading

Essential Oil Safety: A Guide for Health Care Professionals, 2nd Edition
By Robert Tisserand and Rodney Young

If you loved this book please tell your friends! Be sure to check out other books in, 'Healing with Essential Oils' series.

PLEASE NOTE: More and more controlled research studies are being conducted into the efficacy of using essential oils for therapeutic results, including evidence-based research by health professionals, hospitals and medical centers for use with patients. Still, many of the claims about the benefits of using essential oils are anecdotal in nature. You're encouraged to make and keep notes about your own findings when using essential oils.

Aromatherapy is Nature's Medicine in its purest and most essential form. Aromatic plant oils are the very essence of a plant. Even a drop or two can produce significant results for your body, mind and soul. Properly administered essential oils are a natural, safe and effective way to enhance your health and well-being, and may produce satisfying results where other treatment methods have failed. Please consult with your physician regarding serious health concerns and do not attempt to self-diagnose.

ABOUT KG STILES

WITH MORE THAN FOUR DECADES of training and experience as a professional holistic health practitioner, KG has helped tens of thousands of people from all walks of life overcome health challenges and realize their goals and dreams.

KG has worked with many celebrities and has been referred to as the, "Aromatherapist to the Stars!" Her clients have included entrepreneurs and top executives, and her advice and services have been sought not only by internationally famous celebrities and athletes, but by individuals, small business owners, spa therapists, hospitals and medical centers.

KG has formulated aromatherapy products for a variety of health and beauty related treatments for the global marketplace, as well as routinely

blends custom formulas for clients in her consulting practice.

She is the best-selling author of the award-winning book, *The Essential Oils Complete Reference Guide: Over 250 Recipes for Natural Wholesome Aromatherapy*, now in its 5th printing, and winner of a Living Now Gold Medal and Nautilus and Indie Next Generation book awards. She is the National Association of Holistic Aromatherapy (NAHA) Oregon (South) Director.

ENDORSEMENTS:

“I can think of no one better to teach aromatherapy than KG Stiles. Her years of experience combined with her passion to assist and facilitate the personal growth and wellness of all is unsurpassed!”

-Eldon Taylor, Ph.D., FAPA, New York Times Best-selling Author, ‘Choices and Illusions.’

“I highly recommend KG’s books and courses to all who are interested in holistic curing and the way that aromatherapy can be applied as an effective Mind Body technique.”

~John L. Turner, MD, Neurosurgeon

“KG Stiles has been a key resource in creating a hospital-based Aromatherapy program and educating the staff about the therapeutic principals and applications of essential oils.” **~Linda McGwire, RN, BSN, HNC-B**

KG Stiles

P.O. Box 1124

Ashland, OR 97520

www.kgstiles.com

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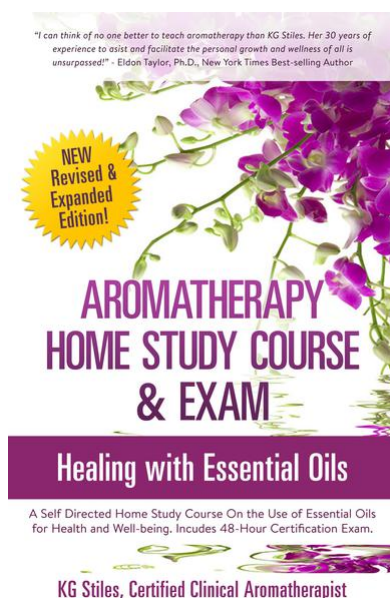
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Did you love *The Chemistry of Essential Oils Made Simple*? Then you should read [*Aromatherapy Home Study Course & Exam*](#) by KG STILES!



A Self Directed Home Study Course On the Use of Essential Oils for Health and Well-being. Includes 48-Hour Certification Exam. Get a Complimentary 2-Hour CE Certificate with your course. KG Stiles is a NAHA Approved Continuing Education Provider.

Aromatherapy is a perfect complement to a professional therapeutic practice. It can also be used in the work place or at home, and very easy to integrate.

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Eighteen (18) Supplemental oils: Blue Tansy, Carrot Seed, Atlas Cedarwood, German Chamomile, Roman Chamomile, Cinnamon Leaf, Clary Sage, Frankincense, Grapefruit, Helichrysum, Melissa, Myrrh, Neroli, Palmarosa, Patchouli, Rose Otto, Sandalwood, Black Spruce.

All the practical information you need for introducing aromatherapy into your professional business practice, home, or workplace.

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What Experts Are Saying: *I highly recommend well-known author and Certified Aromatherapist KG Stiles' books and courses.* - **John L. Turner, M.D. Neuro-surgeon and author Medicine, Miracles & Manifestations**

I've known KG Stiles for many years and she's always shown especial care for the safe and best practices when using essential oils. Highly recommended for the novice, as well as long time aromatherapist. -**Sylla Sheppard-Hanger RA, LMT - Registered Aromatherapist, Founder Atlantic Institute of Aromatherapy**

KG's books and courses are written from years of experience and investigation. Highly recommended! -**Jonathan Goldman, award winning best-selling author and Grammy nominee**

It has been a pleasure working with KG Stiles, Certified Aromatherapist. She has been a key resource in creating a hospital based Aromatherapy program. -**Linda McGwire, RN, BSN, HNC-B**

I highly recommend anyone interested in aromatherapy and holistic healing to check out a course with KG Stiles. -**Steven Farmer, Ph.D., Best-selling author Animal Spirit Guides**

ABOUT YOUR INSTRUCTOR KG STILES, BA, CBT, CBP, LMT is a holistic health educator, licensed massage therapist (Hawaii #6351 and Oregon #2313), certified clinical aromatherapist, providing expert essential oil services since 1980 and founder of the PurePlant Essentials aromatherapy company. Her advice and services have included internationally famous celebrities, athletes, entrepreneurs, top executives, individuals, entrepreneurs, spa therapists and hospitals. She has published hundreds of articles, appearing in Massage Therapy Journal, Massage Today, Breast Cancer Wellness, Aromatherapy Today (Australia) and NAHA Aromatherapy Journal. Her newest awarding winning book, "The Essential Oils Complete Reference Guide," won a 'Living Now' Gold Medal Award and was winner of 'Nautilus' and 'Indie Next Generation' book awards. KG lives in Ashland, Oregon and the NAHA Oregon (South) Director.

Read more at [KG STILES's site](#).

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Chakra Aromatherapy Magic Essential Oils to Supercharge Your Powers of Attraction & Manifestation

Chakra Astrology Your Passion & Soul Life Purpose Elemental Music, Magic & Miracles

Chakra Energy Blocks Mastering Your Hidden Self

Chakra Power Gates of Wisdom & Empowerment Quick Reference Guide

What Are Chakras? Wheels of Light, Sound & Healing

First Chakra Healing - Clear & Balance with Gemstones & Crystals

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Healing with Crystals - Crystal Legends - The Lemurian Seed Crystals

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Watch for more at [KG STILES's site.](#)



About the Author

ABOUT KG STILES KG Stiles is a Certified Clinical Aromatherapist and founding director of PurePlant Essentials aromatherapy company. KG began her professional healing arts practice in 1980. She has formulated aromatherapy products for a variety of wellness and beauty related treatments for the global marketplace, as well custom formulas for clients in her consulting practice. Her clients have included entrepreneurs and top executives, and her advice and services have been used by internationally famous celebrities and athletes, as well as individuals, small business owners and hospitals. She is the best-selling author of, *"The Essential Oils Complete Reference Guide,"* which won a Living Now Gold Medal and Nautilus and Indie Next Generation book awards. Her newest book is, *"The Best Natural Cures Using Essential Oils."* She is the National Association of Holistic Aromatherapy (NAHA) Oregon (South) Director and a NAHA approved continuing education provider.

Read more at [KG STILES's site](#).

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