Aromatherapy Reference Guide

A Science-Based Resource

Proverbs 4:26–27

Ponder the path of thy feet, and let all thy ways be established.
Turn not to the right hand nor to the left: remove thy foot from evil.

Megan Tiehes CA

Welcome to our essential oil reference guide. This is the type of basic resource that I wish I had when I first started. Its goal is to provide you with simple and understandable definitions for common aromatherapy terms in order to boost your confidence, increase your understanding, and to spare you from the exhaustive search for answers.

Note: This guide is for educational purposes only and focuses on some of the most common scientific and practical elements of aromatherapy and does not address mystical or spiritual concepts.

Understanding Essential Oils

Aromatic

Having a distinctive, often pleasant smell. In aromatherapy, this refers to the scent-producing qualities of essential oils derived from their volatile compounds.

Volatile Compounds

Molecules that easily evaporate at room temperature, giving essential oils their characteristic aroma. These compounds are responsible for the scent you smell when you open a bottle.

This is why essential oils are 'aromatic' - their volatile nature allows them to interact with our sense of smell.

Essential Oil

A concentrated aromatic substance obtained from plants, typically through steam distillation or cold pressing. Essential oils contain volatile compounds that are responsible for the aromas and properties of each oil.

Essential oils are lipophilic (oil-soluble) and are not water soluble.

Oil-Soluble (Lipophilic)

Substances that can dissolve in fats and oils.

Essential oils are lipophilic, meaning they must be diluted in a carrier oil (like jojoba or almond oil) for safe topical application. This property is also why they do not mix with water

Water-Soluble (Hydrophilic)

Substances that can dissolve in water.

While essential oils are not water-soluble, hydrosols contain hydrophilic compounds that remain dispersed throughout the water. Because essential oils do not dissolve in water, they will float on the surface, which increases the risk of skin irritation if added to a bath without a proper dispersant.

Non-Volatile

Describes compounds that do not readily evaporate at room temperature and therefore do not easily enter the air. Non-volatile compounds are not responsible for aroma and may remain in extracts or pressed oils rather than steam-distilled essential oils.

Non-Volatile

Molecules that do not evaporate at room temperature.

Because these compounds do not vaporize easily, they are typically left behind during steam distillation but remain present in cold-pressed citrus oils and both solvent t and CO_2 extracts.

Extraction & Production

Understanding extraction methods helps us to interpret quality, safety, and appropriate usage. The extraction method affects which compounds are in the final product.

Steam Distillation

A method of extracting essential oils using steam to release volatile compounds from plant material. The steam carries these compounds upward, where they are condensed back into liquid form and flow into a collection chamber (separator). This process produces both an essential oil and a hydrosol, which naturally separate because oil and water do not mix.

Most essential oils are produced this way.

Hydrosol (Hydrolat)

The aromatic water produced during steam distillation. Hydrosols contain mostly water and water-soluble aromatic compounds but may contain trace amounts of lipophilic compounds.

Hydrosols are produced alongside any steam-distilled essential oil, not only floral oils. They are gentler and far less concentrated than essential oils and have their own properties.

Note for clarity: Some of the aromatic constituents of a plant can have both water-loving and oil-loving forms. The fat-soluble (lipophilic) components are found primarily in the essential oil, while the water-soluble (hydrophilic) compounds are found in the hydrosol. These hydrophilic compounds are completely dissolved in the water and will not separate.

Cold Pressed / Expression

A mechanical method primarily used for citrus oils. Small sacks of oil will break open, releasing the oil, as the peels are physically pressed or grated rather than distilled. This process extracts both volatile and non-volatile compounds from the peel.

Cold-pressed citrus oils (bergamot, lime, lemon, bitter orange) often contain furanocoumarins - compounds that can cause photosensitivity. Always dilute properly and avoid direct sunlight after application.

Solvent Extraction

A method using chemical (synthetic) solvents (most commonly hexane) to extract compounds from plant material. These extracts are not true essential oils and may include non-aromatic compounds and trace solvent residues. This affects the safety, properties, aroma, and viscosity of the product.

Some solvents have potential health concerns with repeated exposure. Many aromatherapists do not consider solvent extracts the preferred option.

CO_2 Extraction

A method using pressurized carbon dioxide as a solvent to extract compounds. CO_2 extracts are considered extracts, not true essential oils, and have a different consistency and composition due to the presence of both aromatic and non-aromatic compounds. Co2 is considered a "natural" solvent and will eaporate back into a gas once pressure is released, so it. is not in the final product.

Understanding these distinctions can help you interpret labeling and quality differences.

Chemistry & Constituents

Chemical Constituents

Naturally occurring compounds within an essential oil (such as linalool, limonene, or menthol) that influence aroma and properties.

Oxidation

The chemical reaction that occurs between an essential oil's constituents and oxygen. Different chemical constituents oxidize at different rates, however, exposure to heat, light, and air speed up the process. Oxidization can potentially alter the aroma, color, or safety profile of an oil.

This highlights the importance of proper storage. Oxidization means that the chemistry of the oil has changed—oxidized oils can cause skin irritation and other safety concerns.

Major Constituents

Major constituents are present in higher concentrations within an oil. These significantly influence the overall aroma and properties of an oil.

Minor Constituents

Minor constituents, though present in smaller amounts, may still significantly influence the overall aroma and properties of an oil.

Synergy

How different constituents interact within a single oil or blend, influencing the overall aroma and properties. This refers to chemical interaction, not mystical effects.

Shelf Life

The amount of time an essential oil is expected to maintain its original, unoxidized form. Once oxidized, the chemistry of the oil is altered and the safety and quality are affected. While oils naturally degrade over time, the primary causes of rapid degradation are exposure to oxygen, heat, and light. Proper storage can extend shelf life, while improper storage can dramatically shorten it.

Citrus oils typically last 1-2 years; most others 2-3 years; some woody oils can last longer when stored properly— avoiding exposure to heat, light, and air (oxygen).

Safety & Usage

Dilution

Reducing the concentration of an essential oil by mixing it with a carrier oil before application. Expressed as a percentage (e.g., 2% dilution).

Proper dilution reduces safety risk by decreasing the concentration of volatile molecules contacting the skin and slowing the rate of absorption into the skin barrier.

Maximum Dilution Rate

The highest recommended percentage of an essential oil that should be used for safe topical application. This rate is based on clinical safety data to prevent adverse reactions such as dermal irritation, systemic sensitization, or phototoxicity.

Exceeding this rate significantly increases safety risks and the likelihood of a severe inflammatory response.

Neat Application

Application of an undiluted essential oil directly to the skin. This method is generally discouraged in professional aromatherapy because using oils at 100% concentration—or even simply exceeding the maximum dilution rate for a given oil—significantly increases safety risks, such as irritation and sensitization. Proper dilution in a carrier oil is recommended to protect the skin barrier and ensure safe absorption.

Sensitization

A delayed allergic immune response that can develop after repeated exposure to a substance. This is a systemic response; once a body is sensitized to an oil, even a small amount of that oil—or one with similar constituents—can trigger a reaction in the future. The risk is significantly increased by frequent “neat” application, exceeding the maximum dilution rate, and the application of oxidized oils.

Proper dilution matters - sensitization can be permanent.

Irritation (Dermal Irritation)

This is a **non-allergic** inflammatory reaction of the skin caused by contact with a substance. Unlike sensitization, which involves the immune system, irritation **typically occurs immediately or shortly after application and is often limited to the specific area of contact**. It can manifest as localized redness, itching, or a burning sensation.

Dermal Maximum

The maximum recommended concentration for safe skin application of a specific essential oil, based on available safety data.

Phototoxic

A chemical reaction that occurs when certain non-volatile compounds, primarily furanocoumarins, react with sunlight—particularly UV rays. Phototoxic essential oils contain these compounds and can cause a skin reaction when applied topically and subsequently exposed to UV light. Unlike sensitization, which is a systemic immune response, a phototoxic reaction is a localized irritation limited to the area of application and light exposure. This reaction can lead to severe inflammation, skin damage, or pigment changes.

Primarily affects cold-pressed citrus oils because the phototoxic compounds can be pressed out with an oil but are non- volatile, preventing them from vaporizing and entering steam distilled oils.

Contraindication

A situation or condition in which the use of a particular essential oil is not recommended due to safety concerns.

Examples include pregnancy, epilepsy, age (infants and the elderly), certain medications, or specific health conditions. These factors can change how the body reacts to certain oils and may increase the risk of a severe inflammatory response or other adverse effects.

Internal Use

The Pondered Path Aromatherapy does not recommend the use of essential oils orally. Internal use can be dangerous and should only be administered under the guidance of a professional specifically trained in this area.

Topical Use

Application of an essential oil to the skin, typically diluted in a carrier oil.

Carrier Oil

A neutral, fatty oil (such as jojoba, sweet almond, or fractionated coconut oil) used to dilute essential oils for safe topical application.

Quality & Sourcing

Botanical Name

The Latin scientific name of a plant (genus and species), ensuring correct identification of an essential for safety and effectiveness.

Common names vary by region, whereas botanical names are universal. For example, the common name "Lavender" can refer to several different plants, but the scientific name Lavandula angustifolia identifies one specific species with a distinct chemical profile.

Chemotype

A chemical variation within the same plant species, resulting in different constituent profiles. Chemotypes are indicated in proper botanical naming.

Example: Rosemary has multiple chemotypes (CT cineole, CT camphor, CT verbenone) with different properties and safety considerations for each.

Adulteration

The addition of synthetic compounds, cheaper oils, or extenders—substances added to increase volume or lower cost—to a product. This affects the purity of an oil and can also affect safety.

Carrier oils can be extenders, but not all extenders are carrier oils.

Pure

Indicates the product contains only the named essential oil, without added synthetic fragrance, fillers, or adulterants.

This distinguishes genuine plant-derived products from synthetic or blended products; it does not indicate the quality, safety, or therapeutic effect.

Quality

A term describing the specific chemical profile and integrity of an essential oil. While "purity" indicates an oil is free from synthetic additives, fillers, or adulterants, it does not guarantee the safety or therapeutic value of the product. High quality is determined by the presence of appropriate ratios of chemical constituents and the absence of contaminants or oxidation markers. This depends on precise harvesting, distillation parameters, and climate-controlled storage to ensure the oil remains chemically stable.

Quality is distinct from therapeutic effect: a pure oil of poor quality (due to factors such as age or oxidation) may still be genuine, but could carry a higher risk of irritation or sensitization.

Country of Origin

This is the specific geographical location where the plant material was grown and harvested. Environmental factors such as climate, soil composition, elevation, and regional growing practices all influence the quality of an essential oil by affecting its chemical makeup (constituents), even among plants of the same species.

Lavender grown in the high altitudes in France will have a different chemical makeup than the same species of lavender at a lower altitude.

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References

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