# REVIEW ON ESSENTIAL OILS FROM JASMINE FLOWER USING SOLVENT EXTRACTION METHOD

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**ABSRTACT**

*Essential oil, sometimes referred to as ethereal oil, is a concentrated, hydrophobic liquid that is made up of hundreds of organic constituents, including vitamins, hormones, and other naturally occurring substances. These substances are taken from a plant's leaves, stems, blossoms, bark, roots, and other parts. There are highly volatile components in essential oils*

**KEYWORDS:-** *Blossoms, Ethereal Oil, Highly Volatile Components.*

## INTRODUCTION

Within the protoplasm of its cells, plants synthesize their essential oils. The oil is an excretion and does not contribute to the plant's metabolism. Given that the oils are highly energetic and chemically active, it is a little unexpected that the plant would release so much energy without utilizing it. Within the plant glands, the oils are kept as tiny droplets. These droplets disperse across the plant's surface after gradually permeating the gland wall, and then they evaporate, releasing a waft of fragrant air.

There are several uses and applications for essential oils. They have a profoundly calming, stress-relieving, and anxiety-relieving effect on the central nervous system. In perfumery, a variety of essential oils are employed. To make one ounce of essential oil, several pounds of flowers are needed. In addition, essential oils are used in aromatherapy, a type of medicine. Many essential oils are frequently diluted, and occasionally artificial compounds are added to the oil.

### History :

The word perfume derives from the Latin perfume, meaning "to smoke through". Perfumery, as the art of making perfumes, began in ancient Mesopotamia, Egypt, the Indus Valley civilization and possibly Ancient China. It was further refined by the Romans and the Muslims. On the Indian subcontinent, perfume and perfumery existed in the Indus civilization (3300 BC – 1300 BC). In 2003, archaeologists uncovered what are believed to be the world's oldest surviving perfumes in Pyrgos, Cyprus. The perfumes date back more than 4,000 years. They were discovered in an ancient perfumery, a 300-square-meter (3,230 sq ft) factory housing at least 60 stills, mixing bowls, funnels, and perfume bottles. In ancient times people used herbs and spices, such as almond, coriander, myrtle, conifer resin, and bergamot, as well as flowers.[In May 2018, an ancient perfume "Rodo" (Rose) was recreated for the Greek National Archaeological Museum's anniversary show "Countless Aspects of Beauty", allowing visitors to approach antiquity through their olfaction receptors. In the 9th century the Arab chemist Al-Kindi (Alkindus) wrote the Book of the Chemistry of Perfume and Distillations, which contained more than a hundred recipes for fragrant oils, salves, aromatic waters, and substitutes or imitations of costly drugs. The book also described 107 methods and recipes for perfume-making and perfume-making equipment, such as the alembic . The Persian chemist Ibn Sina (also known as Avicenna) introduced the process

of extracting oils from flowers by means of distillation, the procedure most commonly used today. He first experimented with the rose. Until his discovery, liquid perfumes consisted of mixtures of oil and crushed herbs or petals, which made a strong blend. Rose water was more delicate, and immediately became popular. Both the raw ingredients and the distillation technology significantly influenced western perfumery and scientific development By the 18th century the Grasse region of France, Sicily, and Calabria (in Italy) were growing aromatic plants to provide the growing perfume industry with raw materials. Even today, Italy and France remain the center of European perfume design and trade.

## Plan of work:

I. Selection of topic
II. Literature survey
III. Selection of pre-current drug and excipients
IV. Pre-formulation study
V. Preparation & optimization of perfume
VI. Result & Discussion
VII. Conclusion
VIII. Submission of work

Commercially, essential oils are used in three primary ways :

**Flavors**

Present in bakery goods, candies, confections, meat, pickles, and soft drinks.

**Pharmaceuticals**

Appear in dental products and a wide but diminishing group of medicines.

**Odorants**

Use in cosmetics, perfumes, soaps, detergents, and miscellaneous industrial

products ranging from animal feed to insecticides to paints

· **Tastes**

found in meat, pickles, soft drinks, candies, baked products, and confections.

· **Drugs**

appear in a broad but dwindling range of medications and dental products.

· **Fragrances**

Use in perfumes, soaps, detergents, cosmetics, and many industrial goods like paints, pesticides, and animal feed

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Melur, or the local name for jasmine flowers, was selected for these specific tests. Jasmine is a flower with a lovely aroma. This study aimed to investigate the viability of developing an absolute essential oil. Essential oils are different from fatty or fixed oils, which are mostly composed of glycerides, and mineral or hydrocarbon oils in terms of composition. The term "essential oil" comes from the belief that these oils embody the essence of scent and flavor found in flowers.

## PROBLEM STATEMENT

Although there are various useful meanings for the phrase "essential" or "volatile oils," a scientific definition is not attainable. The most widely used definition of an essential oil is a somewhat volatile substance that is physically separated from an odorous plant belonging to a single botanical species.

The scent of jasmine essential oil is floral and sweet. Because of its potent anti-depressant and aphrodisiac properties as well as its three mental confidence-boosting properties, jasmine is highly sought after. The Chinese used jasmine to purify the air in sick rooms. The Egyptians also used it to treat headaches, insomnia, and nervous disorders. Although jasmine essential oil is pricey these days, particularly in the aromatherapy industry, it is worth it for the skin

It improves skin elasticity and promotes cell growth. Since the flowers only bloom at night, they can only be picked during the night.

One ounce of jasmine essential oil requires enormous amounts of petals. Jasmine essential oil is extremely rare and valuable due to the large amount of petals required to produce it.

In perfumery, scent extracts made from flowers are commonly used.

industry and are worth a great deal on the market. Several times, unrefined cosmetics Early treatment of the materials prevents the deterioration of their scent. There exist multiple techniques for obtaining essential oil. Steam distillation is used to extract the majority of oils. approach. Using this technique, steam permeates the plant. Thus, this will result in the plant tissues disintegrating. Consequently, the water vapor and essential oils are discharged, gathered, and cooled. The traditional method of steam distillation is inappropriate for handling such materials because it causes numerous compounds to degrade thermally within the flowers

This justifies the use of solvent extraction. A quasi-solid product known as "concrete" is produced following solvent vaporization. This product contains flavoring compounds and fragrance compounds like hydrocarbon terpenes, oxygenated terpenes, sesquiterpenes, and oxygenated sesquiterpenes.

Furthermore, fatty acids and their methyl esters, diterpenes, and other high molecular weight lipophilic compounds can be found in concrete. There are also significant amounts of paraffins, which are part of the cuticular waxes that cover the surface of flowers (50–70% by weight and higher). Solvent extraction is an additional extraction technique. This technique uses the idea of an analyte's relative solubility in two immiscible liquids.

As an alternative, a mixture of essential oils and other lipophilic plant material can be extracted using supercritical carbon dioxide under extreme pressure (up to 100 atm).

A literature review was then conducted, taking into account the small-scale industries that produce perfumes using conventional methods. It reveals that there is a sizable market for flower extracts, particularly those made from jasmine, rose, Champak, and davana leaves.

The oil's name is the same as the name of the plant it comes from.

It is unclear exactly what role the plant's essential oil plays. Natural selection may be aided by the scents of the flowers, which may attract or repel specific insects. Oils found in roots, wood, and leaves may serve as defenses against plant parasites and animal grazing.

In China and Egypt, essential oils derived from volatile plants have been used for thousands of years to promote both physical and mental health. Given their lengthy history, it was astonishing that a French chemist named Rene-Maurice Gattefosse was the only one to discover the possible medical applications of essential oils in the early 20th century.

In a nutshell, essential oil is a liquid typically extracted from a plant's leaves, stems, flowers, bark, roots, or other parts. Most essential oils are transparent and retain the genuine essence of the plant from which they were extracted. It is not the same as perfume or fragrance oils, which lack the therapeutic advantages of essential oils and are made artificially or contain artificial ingredients.

As the name stands, essential oils can be used for treating burned skin or to heal wounds due to their anti-inflammatory properties. When the oils are applied to the skin, they will be absorbed into the bloodstream to provide numerous components that are believed to aid in a variety of health, beauty, and hygiene conditions. When essential oils are inhaled into the lungs, they offer psychological benefits as the aroma of the natural tradition of using essential oils to treat depression, exhaustion, labor pains, and sensitive skin. On top of that, some oils, for instance, act as a natural repellent and pesticide, e.g. to keep the mosquitoes away.

## ESSENTIAL OILS: AN OVERVIEW

Essential oils are liquids that are typically extracted from a variety of plant parts, such as leaves, stems, flowers, and roots, that contain potent aromatic components. For instance, it can be found in the flowers of roses, the leaves of basil, the wood of sandalwood, and so forth. The various chemical compounds that make up these aromatic substances are present in the plant in their natural form. For example, some of the main ingredients are alcohol, hydrocarbons, phenol, aldehydes, esters, and ketones. In addition, it might include hundreds of organic components, such as vitamins, hormones, and other elements found in nature. Compared to the oils in dried herbs, they have a 75–100 times

Furthermore, these aromatic characteristics of essential oils may provide various functions for the plants itself including; attracting or repelling insects (odors of the flowers); while in plant metabolism, a few essential oils might involved in this process; Leaf oils, wood oils, and root oils may serve to protect against plant parasites or depredations by animals as well as anti-bacterial agent which is utilizing the hormone in the oil. There are only about 700 plants are considered aromatic among all types of plants in the world thus they are all important for the production of essential oils. Today, we could also easily find synthetic essential oils in the market where the price would be cheaper than the pure ones. There are a few differences between synthetic essential oils and pure essential oils. Synthetic essential oils are produced by blending aromatic chemicals mostly derived from coal tar. These oils may duplicate the smell of the pure essential oils, but the complex chemical components of each essential oil created in nature determine its true aromatic benefits. While synthetic essential oils are not suitable for aromatherapy, they add an approximation of the natural scent to crafts, potpourri, soap and perfume at a fraction of the cost. The reason of these synthetic products is mainly to reduce the cost of production.

higher concentration.

| | | | |
|---|---|---|---|
| Jasmine | *Jasminum Officinale* | Analgesic (mild), antidepressant, anti-inflammatory, antiseptic, antispasmodic, aphrodisiac, carminative, cicatrisant, expectorant, galactagogue, sedative, tonic (uterine). | Depression, nervous exhaustion, and stress related conditions, jasmine is said to produce the feeling of optimism, confidence, euphoria, it is especially good in cases of apathy, indifference, or listlessness. Jasmine is also used for catarrh, coughs, laryngitis, dysmenorrhoea, labor pains, uterine disorders, skin problem such as dry, greasy, irritated, sensitive skin, and for muscular spasms and sprains. |
| Lavender | *Lavendula Vera Officinalis* | Analgesic, anticonclusive, antidepressant, antimicrobial, antirheumatic, antiseptic, antispasmodic, antitoxic, deodorant, sedative, diuretic, choleretic, hypotensive, stimulant, tonic, vulnery, cytophylatic, insecticide. | Excellent first aid oil. It soothes cuts, bruises and insect bites. One of the most versatile therapeutic essences. For nervous system disorders such as depression, headache, hypertension, insomnia, migraine, sciatica, shock. Useful in treating skin conditions such as acne, allergies, athlete's foot, boils, dandruff, dermatitis, sunburn, eczema. Treatment of disorders such as rheumatism, throat infections, flu, bronchitis, and asthma. |

### 2.1.1 PROPERTIES AND USES OF THE ESSENTIAL OILS

Each essential oil has it own properties and uses which can classified and identified accordingly to the type of plant it was derived. Table 2.2 shows the properties and uses of the top essential oil.

Table 2.2: Properties and uses of the top essential oils.

| Essential oil | Biological Name | Properties | Uses |
|---|---|---|---|
| Clory Sage | *Salvia Sclarea* | Warming, soothing, antiseptic, anticonvulsive, astringent, antiphlogistic, digestive, deodorant, tonic, uterine, bactericidal, antidepressant. | Menstrual problems, anxiety, depression, high blood pressure, acne boils, oily skin and hair, cramp, migraine, the genitor-urinary system disorders such as amenorrhoea, wrinkles, ulcers. |
| Eucalyptus | *Eucalyptus Globulus* | Antiseptic, analgesic, antineuralgic, antirheumatic, antispasmodic, diuretic, expectorant, antiviral, hypoglycaemic, febrifuge, vulnerary, depurative, stimulant. | Muscular aches and pains, poor circulation, rheumatoid arthritis, asthma, bronchitis, flu, cold, epidermics, chicken pox, headaches, neuralgia, throat infections, skin disorders such as burns, cuts, herpes, wounds, insect bites. |
| Geranium | *Pelargonium Graveolens* | Soothing, refreshing, relaxing, antidepressant, astringent, antiseptic, antihaemarrhagic, deodorant, diuretic, fungicidal, anti-inflammatory. | Anxiety, adrenocortical glands and menopausal problems, sore throat, tonsillitis, cellulites, engorgement of breast, broken capillaries, eczema, hemorrhoids, oily complexion, mature skin. |

| Name | Part of the plant used | Botanical name | Important constituents | Uses |
|---|---|---|---|---|
| Lemongrass and citronella | Leaf | *Cymboposon spp* | Citral Citronella Terpenes | Perfumery Disinfectant |
| Eucalyptus | Leaf | *Eucalyptus globules Eucalyptus citriodora Eucalyptus dives* | Cineale Citronella Terpenes | Not mention |
| Cinnamon leaf | Leaf | *Cinnamon zeylanicum* | Eugenol | Used to make artificial vanilla |
| Clove | Bud | *Eugenia caryophyllus* | Eugenol | Dentistry flavouring |
| Turpentine | Not mention | *Pinus spp* | Terpenes | Paints |
| Lavender | Flower | *Lavendula intermedia* | Linalool | Perfumery |
| Sandalwood | Wood | *Santaium album* | Sanatols | Perfumery |
| Nutmeg | Nut | *Myristica fragrans* | Myristicin | Not mention |
| Almond | Nut | *Prunis communis* | Benzaldehyde | Not mention |
| Corainder | Seed | *Coriandrum sativum* | Linalool Terpenes | Not mention |

**SCOPE**

This research is based on experimental studies of solvent extraction (using methanol and ethanol). To achieve the objectives mentioned above, three scopes have been identified:

I. Jasmine flowers were acquired locally to prepare the blended sample to be used in the extraction process. A standard procedure will be developed from this research work.

II. To determine the optimum extraction time in producing the highest quality and substantial yield of essential oil.

III. To determine the best solvent in producing the highest quality and yield of

essential oil.

IV. To analyze the product composition from the extraction process

## Harmfulness

Due to toxicity levels, essential oils like Ajowan, exotic basil, white camphor, Cassia, Virginian cedarwood, cinnamon (leaf), clove (bud), coriander, eucalyptus, sweet fennel, hyssop, juniper, nutmeg, pepper (black), Spanish sage, tagetes, white thyme, and turmeric should only be used at dilution (at least 1:3) and for a maximum of two weeks.

## The phototoxicity

If an oil is applied to an area of skin that is exposed to direct sunlight, it may result in skin pigmentation. Essential oils like orange, lemon, lime, ginger, bergamot, and cumin shouldn't be applied topically or diluted if the skin area is exposed to direct sunlight.

## Being pregnant

Because of the heightened sensitivity of the developing fetus, essential oils during pregnancy should be used at half the recommended amount. Pregnant women should completely avoid the following essential oils: adjoin, angelica, anise star, anise seed, basil, Cedarwood (all types), celery seed, cinnamon leaf, citronella, clary sage, clove, cumin, sweet fennel, hyssop, juniper, nutmeg, Spanish

Skin/dermal irritation

Sweet basil, black pepper, borneol, cajeput, caraway, Virginian cedarwood, clove (bud), cinnamon (leaf), eucalyptus, garlic, ginger, lemon, peppermint, pine needle (scotch and longleaf), white thyme, and turmeric are among the oils that can irritate skin, especially when used in high concentrations.elevated blood pressure

Avoid using oils of hyssop, rosemary, common and Spanish sage, and thyme if you have high blood pressure.

## Skin irritation or dermal irritation

Sweet basil, black pepper, borneol, cajeput, caraway, Virginian cedarwood, clove (bud), cinnamon (leaf), eucalyptus, garlic, ginger, lemon, peppermint, pine needle (scotch and longleaf), white thyme, and turmeric are among the oils that can irritate the skin, especially when used in high concentrations.

## Rotation of Optical

This method detects the left and right directions as well as the amount that light rays rotate or bend when they travel through essential oil. The degree and speed of refraction could be wrong if the oil has been tainted.

iii. Index of Refraction

With this method, the speed at which light refracts through oil is measured. The degree and speed of refraction may be altered if the oil has been tainted.

## ENVIRONMENTAL OILS CAPACITY

A few scientific analyses of each essential oil are necessary to guarantee that they are all of the highest caliber and are pure. There exist four primary analyses that are feasible to conduct.

**i. Specific Gravity**

At 25˚C, essential oil weight is measured. Each oil has a different composition of ingredients. These ingredients have a consistent weight at a certain temperature. The weight might shift if the oil has become tainted.

**Rotation of Optical**

This method detects the left and right directions as well as the amount that light rays rotate or bend when they pass through essential oil. The degree and speed of refraction could be off if the oil has been tainted.

iii. **Index of Refraction**

With this method, the speed at which light refracts through oil is measured. The degree and speed of refraction may be altered if the oil has been tainted.

**Gas Chromatography**

Using this method, the individual components of an essential oil are separated, and the quantity of each component is determined. The presence and quantity of each constituent would be compared to positively confirm the botanical identity of the oil. This assessor can look for ingredients that are absent, non-

**Chromatography by Gas**

This method measures the quantity of each element contained in an essential oil after separating its basic parts. By comparing the quantity and presence of each component, it would positively prove the botanical identity of the oil. The assessor possesses the ability to detect artificial or absent components or components present in abnormally elevated proportions, which could indicate adulteration.

## JASMINE FLOWERS: AN INTRODUCTION

According to perfumeries, one kilogram of pure oil, which is worth roughly RM13,260, requires seven million jasmine flowers. Early in the morning, when jasmines have the most oil content, each flower needs to be hand-picked. Hindus in Penang especially love jasmine; they wear it in their hair for prayers and other events. An intense concentration of jasmine absolute is used in Jean Patou's Joy, the priciest perfume in the world (RM1,380 per ounce).

There are 200 species in the genus Jasmine, which includes bushes and climbing vines that are indigenous to tropical and warm climates. Most species are climbers, growing up other plants or structures. Most varieties, which reach up to 20 feet in height and have star-shaped flowers, have opposite leaves that can be either deciduous or evergreen. Simple, trifoliate, or pinnate leaves can have up to nine leaflets.

The majority of jasmine species have white flowers, however some have yellow flowers. Jasmine typically has five or six petals, in contrast to the majority of Oleaceae genera, which have four petals. They frequently have a powerful, pleasant scent. Most species flower in the spring or summer, but some, like J. nudiflorum, flower in the winter on the bare branches of this deciduous species. Jasmine flowers are typically picked at night, when the scent is strongest.The majority of jasmine species have white flowers, however some have yellow flowers. Jasmine typically has five or six petals, in contrast to the majority of Oleaceae genera, which have four petals. They frequently have a powerful, pleasant scent. Most flowers bloom in the spring or summer.

## A SYNOPSIS OF JASMINE FLOWERS

According to perfumeries, seven million jasmine flowers are needed to make one kilogram of pure oil, which is worth RM13,260. Because jasmines have the highest oil content early in the morning, each flower needs to be hand-picked. Hindus in Penang love jasmines so much that they wear them in their hair on special occasions and during prayers. The priciest perfume in the world, Joy by Jean Patou (RM1, 380 per ounce), contains a high concentration of jasmine absolute.

**The Essential Oils of Java**

The most manly of all the flower scents is jasmine, also referred to as the "King of Flowers." Jasmine Sambac, in particular, is more musky, spicy, exotic, and mysterious than jasmine grandiflorium. Gentler and softer is jasmine grandiflorium.

Despite being one of the priciest oils, jasmine essential oil is a great investment due to its potency and amazing fragrance power. Jasmine grandiflorum typically reacts well to all types of oils. It balances out fragrances and is often especially effective when combined with other aphrodisiac oils like sandalwood and ylang ylang

**Introduction: Extraction of Essential Oils**

The main application of essential oils is in the making of fragrances, like soap and perfumes. Despite having some chemical constituents that resemble "oils," essential oils are light and non-greasy in and of themselves. However, essential oils have a higher volatility and a faster rate of evaporation due to their high alcohol content.

## EXTRACTION OF ESSENTIAL OILS

### INTRODUCTION:

Fragrances, like soap and perfumes, are the main products made with essential oils. Despite having some chemical constituents that resemble "oils," essential oils are light and non-greasy in and of themselves. However, essential oils have a higher volatility and a faster rate of evaporation due to their high alcohol content.

The quantity and quality of essential oils are determined by the extraction method chosen.

### CHARACTERISTICS OF SUPERCRITICAL CO2 EXTRACTION

It can be seen from Figure 2.2 and Table 2.4 that the critical point for carbon dioxide is at a temperature of 31.10 C and a pressure of 73.8 bar. Therefore, a potential area for the industrial use of supercritical fluid 24 processing is the supercritical extraction of the compounds that give vegetables their scents. The traditional methods of obtaining these products—solvent extraction and steam distillation—are being replaced with great interest. Since CO2 is non-toxic and permits supercritical operation at almost room temperature and relatively low pressure, it is the preferred supercritical solvent for the extraction of fragrance compounds. Supercritical CO2 functions generally like a lipophilic solvent, but it has the advantage over liquid solvents in that its selectivity can be adjusted to values that range from gas-like to liquid-like. Not to mention, the products naturally contain fewer solvent residues. The following lists the additional benefits of employing supercritical CO2 extraction:

The quantity and quality of essential oils are determined by the extraction method chosen.

Techniques on Hand

**Supercritical Extraction of Carbon Dioxide**

High pressure causes carbon dioxide (CO2) to change from a gas to a liquid. The aromatic molecules can be extracted from this liquid using a method akin to that of extracting absolutes, making it a very safe and inert solvent. Naturally, the benefit is that there is no solvent residue left behind. This is due to the fact that carbon dioxide can easily revert to gas and evaporate at normal pressure and temperature. Since more aromatic chemicals are released during the supercritical extraction process, compared to steam distillation, the products of this method appear to have a richer and more intense scent when it comes to the same essential oil.

Before the extraction, other elements including plant species, the chemical composition of the oils, and the location of the oils within the plant (root, bark, wood, branch, leaf, flower, fruit, and seed) must be taken into account.

Certain plants, such as jasmine and rose, have very little essential oil. They are extracted using a chemical solvent to release their significant aromatic properties. The final product, called an absolute, has additional plant components in addition to essential oil. Though not true

essential oils, absolutes are commonly used for fragrance cosmetic products like fine

perfumes. Some extraction methods are described herein.

Techniques on Hand

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**Extracting Solvents**

To aid in the dissolution of the essential oil, a hydrocarbon solvent is added to the plant material. What's left over after the solutions are distilled, filtered, and concentrated is a material that contains resin or a mixture of wax and essential oil called concrete. The oil is extracted from the concentrate using pure alcohol, and the oils are This isn't thought to be the best extraction technique because the solvents may leave behind minute residues that trigger allergies or compromise immune function.

Fig. Jasmin flower

**Enfleurage**

Certain flowers, like tuberose and jasmine, are too delicate or have low essential oil contents to be heated without destroying the blossoms first. In these circumstances, the essential oils may occasionally be extracted using this technique. The essential oils are absorbed by placing flower petals on trays filled with odorless vegetable or animal fat. Every day or every few hours, the depleted petals are removed and replaced with fresh ones once the fat has absorbed the essential oils as much as possible.

This process is repeated until the essential oil is fully saturated in the fat or oil. The essential oil and fatty substance will separate from one another when alcohol is added to this mixture. The alcohol then evaporates, leaving only the essential oils behind. Nevertheless, this method of extraction is extremely labor-intensive, and expensive, and these days, it's only occasionally used to extract essential oil from jasmine and tuberose.

## 2.5 SUPERCRITICAL FLUID EXTRACTION

### 2.5.1 PROPERTIES OF SUPERCRITICAL FLUID

A supercritical fluid is defined as a substance above its critical temperature ($T_c$) and critical pressure ($P_c$). The critical point represents the highest temperature and pressure at which the substance can exist as a vapor and liquid in equilibrium. The phenomenon can be easily explained with reference to the phase diagram for pure $CO_2$ (Figure 2.2).

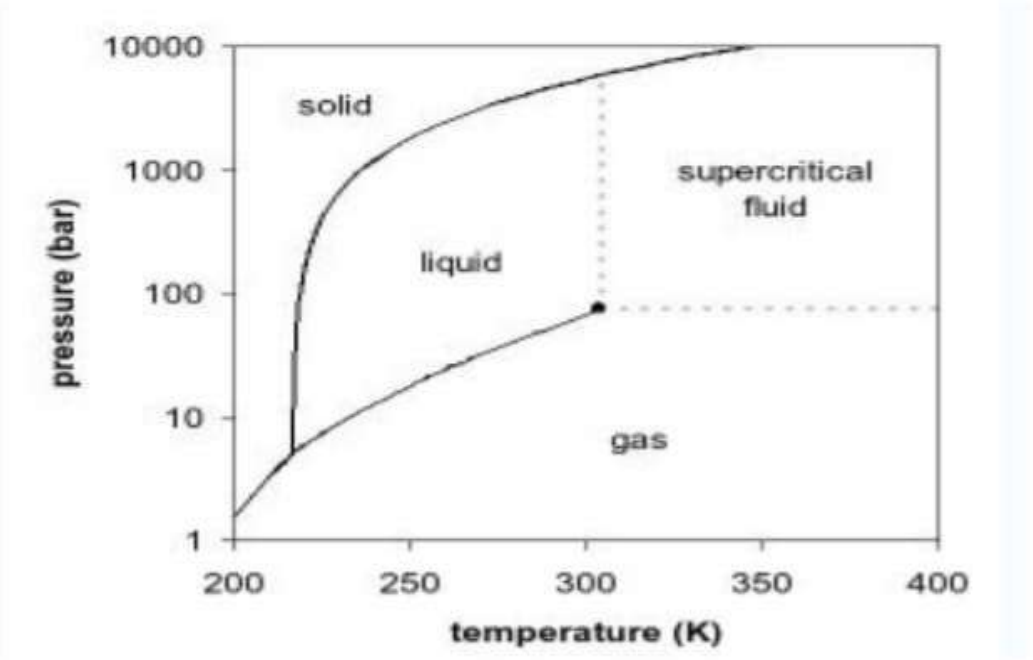


**Figure 2.2:** Phase Diagram of Carbon Dioxide

**Table 2.4:** Critical Properties of Various Solvents.

| Solvent | Molecular weight | Temperature | Pressure | | Density |
|---|---|---|---|---|---|
| | (g/mol) | (K) | (MPa) | (bar) | ($g/cm^3$) |
| Carbon dioxide | 44.01 | 304.1 | 7.38 | 73.8 | 0.469 |
| Water | 18.02 | 647.3 | 22.12 | 221.2 | 0.348 |
| Methane | 16.04 | 190.4 | 4.60 | 46.0 | 0.162 |
| Ethane | 30.07 | 305.3 | 4.87 | 48.7 | 0.203 |
| Propane | 44.09 | 369.8 | 4.25 | 42.5 | 0.217 |
| Ethylene | 28.05 | 282.4 | 5.04 | 50.4 | 0.215 |
| Propylene | 42.08 | 364.9 | 4.60 | 46.0 | 0.232 |
| Methanol | 32.04 | 512.6 | 8.09 | 89.0 | 0.272 |
| Ethanol | 46.07 | 513.9 | 6.14 | 61.4 | 0.276 |
| Acetone | 58.08 | 508.1 | 4.70 | 47.0 | 0.278 |

## RESULT

A substance above its critical temperature (Tc) and critical pressure (Pc) is referred to as a supercritical fluid. The maximum temperature and pressure at which a substance can exist in equilibrium as a vapor and a liquid is known as the critical point. The pure CO2 phase diagram makes it simple to understand the phenomenon.

## SUMMARY

Its unique properties allow it to dissolve materials like a liquid and diffuse through solids like a gas. Furthermore, it is easily able to alter its density in response to slight variations in pressure or temperature. Because of these characteristics, it can be used in a procedure known as supercritical fluid extraction in place of organic solvents. The two most often used supercritical fluids are CO2 and water. Table 2.4 compares the essential characteristics of different solvents**.**

## CONCLUSION

The risk associated with organic solvent extraction is eliminated because CO2 is inexpensive, readily available, and does not burn or explode.

ii. The solvents can be recovered easily, conveniently, and with less energy use.

iii. CO2 is non-toxic, odorless, stateless, and chemically inert, meaning it won't contaminate goods or the environment. Consequently, the material leftovers don't need to be treated.

Perfume have made or significant impact on the society during past and present it was surprised to know that some ingredients were from plants and animals this turn out to be the makeup of most of the fragrances that men & women use today in their colonges and perfumes. Perfume formulated in this article was made by using herbal ingredients like jasmine , orange oil which doesn’t cause irritation to skin and do not prolong any type of

side effects cause due to marketed perfumes. As well as it gives prolong aroma of jasmine and orange which mediate olfaction and gives satisfaction to the user.

IV. There is a lot of permeability. Therefore, compared to the extraction time of a typical solvent, the extractive time may be significantly shorter.

v. The temperature manipulation is close to room temperature, making it appropriate for heat-sensitive materials. Is it possible to find a genuine style and superior extraction product? This was not the outcome of the other extraction technique**.**

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