

***ZEON's
AROMA
CHEMICALS***



ZEON

INTRODUCTION

OUTLINE OF ZEON CORPORATION

ZEON CORPORATION established in 1950, is a manufacturer of polyvinylchloride, synthetic rubbers and latices, chemical products and polymer fabricated products in Japan.

It is well known to the petrochemical industry that ZEON CORPORATION has developed unique extractive distillation processes using C₄ and C₅ fractions of naphtha to produce high purity butadiene and isoprene, both of which are the basic raw materials for synthetic rubbers.

From the early 1980's ZEON CORPORATION has diversified into many new areas including specialty chemicals, electronic chemicals and medical products.

SPECIALTY CHEMICALS AND “EMOSCENT”

ZEON CORPORATION's Specialty Chemicals Division utilizes C₅ fractions from naphtha to produce its specialty chemicals.

These chemicals are crucial in flavors, fragrances, intermediates used in pharmaceutical & agricultural materials, and other various chemicals for industrial use.

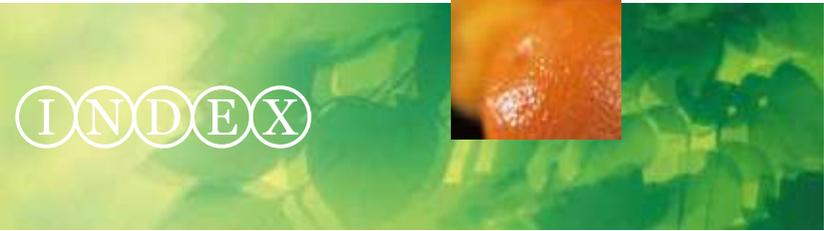
As a market leader in the aroma chemical field, ZEON CORPORATION is well known for its Green Notes: Leaf alcohol and Leaf esters, Jasmine Notes: Methyl dihydrojasmonate and Methyl jasmonate, and Lactone Notes.

By creating such products, ZEON CORPORATION is playing a significant role in the scents we come across daily.

“EMOSCENT” is the brand name for ZEON CORPORATION aroma products. Under this brand, we will serve you with enriched lines of aroma chemicals. Based on the combination of abundantly available in-house raw materials and the high-level technologies of organic syntheses, we have been developing various kinds of fine chemicals. At ZEON CORPORATION we are constantly striving to develop new aroma chemicals.



DESCRIPTION OF ZEON'S AROMA CHEMICALS



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As representative Green Notes of aroma chemicals, cis-3-Hexenol (Leaf alcohol) and Leaf esters play important roles in various kinds of fragrances and flavors. ZEON CORPORATION is a world market leader in the Green Notes field and has successfully developed new products such as 3,6-Nonadienol, cis-3-Hexenal and cis-6-Nonenol.

ZEON's AROMA CHEMICALS
EMOSCENT®

cis-3-Hexenol (Leaf alcohol)



cis-3-Hexenol is widely well-known as Leaf alcohol, and it is frequently used not only in floral green fragrances but also in fruity and mint flavors.

cis-3-Hexenol gives fresh and natural green effects to top notes.

| | |
|---------------------------|---|
| ODOR | Fresh and Natural Green, Grassy, Powerful |
| APPEARANCE | Colorless to pale yellow liquid |
| NATURAL OCCURRENCE | Found in many flowers, fruits, herbs, and vegetables |
| USE | Used as a refreshing green top note in floral, fruity, herbal, minty flavor and fragrance compounds |
| TENACITY | 1 day on a smelling blotter |

PHYSICAL PROPERTIES

| | |
|----------------------|----------------------------------|
| ● Formula | C ₆ H ₁₂ O |
| ● CAS Name | 3-Hexen-1-ol,(Z)- |
| ● CAS No. | 928-96-1 |
| ● UN No. | 1987 |
| ● Flash point | 59°C ±2°C (closed cup) |

ANALYTICAL SPECIFICATIONS

| | |
|------------------------------------|-------------|
| ● Purity (GC %) | min. 98.00% |
| ● Specific gravity (d20/20) | 0.845~0.851 |
| ● Refractive index (n20/D) | 1.436~1.442 |
| ● Acid value (mg KOH/g) | max. 1.0 |

REGISTRATION

| | |
|---|-----------|
| ● TSCA, DSL, CHINA, ECL, AICS, PICCS | Listed |
| ● EC No. | 213-192-8 |
| ● FEMA | 2563 |
| ● KOSHER | Certified |

| | |
|------------------------------|---|
| APPLICATION STABILITY | Stable in a wide range of applications such as alcoholic, cosmetic, toiletry and household products |
|------------------------------|---|

| | |
|---------------------------|---|
| STORAGE CONDITIONS | Containers should be kept in a dark cool place after purging air with nitrogen. |
|---------------------------|---|

cis-3-Hexenyl acetate



cis-3-Hexenyl acetate is one of cis-3-Hexenol's popular esters, which is frequently used not only in floral green fragrance but also in fruity flavor to give fresh and sharp green fruity effects in compounds.

| | |
|---------------------------|---|
| ODOR | Fruity, Green, Apple, Green banana-like |
| APPEARANCE | Colorless to pale yellow liquid |
| NATURAL OCCURRENCE | Found in Jasmine, various fruits including Apple, Guava and Passionfruit |
| USE | Used as a refreshing top note in floral, fruity, minty flavor and fragrance compounds |
| TENACITY | 2~3 hours on a smelling blotter |

PHYSICAL PROPERTIES

| | |
|----------------------|---|
| ● Formula | C ₈ H ₁₄ O ₂ |
| ● CAS Name | 3-Hexen-1-ol, acetate-, (Z)- |
| ● CAS No. | 3681-71-8 |
| ● UN No. | 3272 |
| ● Flash point | 57°C ± 2°C (closed cup) |

ANALYTICAL SPECIFICATIONS

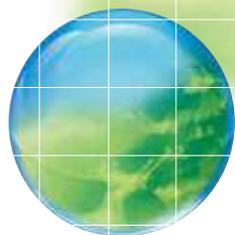
| | |
|------------------------------------|-------------|
| ● Purity (GC %) | min. 98.00% |
| ● Specific gravity (d20/20) | 0.898~0.904 |
| ● Refractive index (n20/D) | 1.424~1.430 |
| ● Acid value (mg KOH/g) | max. 2.0 |

REGISTRATION

| | |
|---|-----------|
| ● TSCA, DSL, CHINA, ECL, AICS, PICCS | Listed |
| ● EC No. | 222-960-1 |
| ● FEMA | 3171 |
| ● KOSHER | Certified |

| | |
|------------------------------|---|
| APPLICATION STABILITY | Stable in a wide range of applications such as alcoholic, cosmetic, toiletry and household products |
| STORAGE CONDITIONS | Containers should be kept in a dark cool place after purging air with nitrogen. |

cis-3-Hexenyl salicylate



cis-3-Hexenyl salicylate is one of cis-3-Hexenol's popular esters. This is an important item frequently used in fine fragrance, toiletries and household products. cis-3-Hexenyl salicylate produces green and floral effects in compounds.

| | |
|---------------------------|--|
| ODOR | Floral, Green, Balsamic |
| APPEARANCE | Colorless to pale yellow liquid |
| NATURAL OCCURRENCE | Found in Lilium Longiflorum Thumb, Narcissus |
| USE | Used as floral green balsamic note in a wide range of applications |
| TENACITY | more than 2 weeks on a smelling blotter |

PHYSICAL PROPERTIES

| | |
|----------------------|--|
| ● Formula | C ₁₃ H ₁₆ O ₃ |
| ● CAS Name | Benzoic acid, 2-hydroxy-, 3-hexenyl ester,(Z)- |
| ● CAS No. | 65405-77-8 |
| ● UN No. | 3082 |
| ● Flash point | 156°C (open cup) |

ANALYTICAL SPECIFICATIONS

| | |
|------------------------------------|-------------|
| ● Purity (GC %) | min. 97.00% |
| ● Specific gravity (d20/20) | 1.059~1.067 |
| ● Refractive index (n20/D) | 1.518~1.525 |
| ● Acid value (mg KOH/g) | max. 2.0 |

REGISTRATION

| | |
|---|-----------|
| ● TSCA, DSL, CHINA, ECL, AICS, PICCS | Listed |
| ● EC No. | 265-745-8 |
| ● FEMA | 4750 |

| | |
|------------------------------|---|
| APPLICATION STABILITY | Stable in a wide range of applications such as alcoholic, cosmetic, toiletry and household products |
| STORAGE CONDITIONS | Containers should be kept in a dark cool place after purging air with nitrogen. |

cis-3-Hexenal



cis-3-Hexenal offers the scent of tomato and various vegetables.

ZEON CORPORATION has successfully developed the commercial process of manufacturing this product.

| | |
|---------------------------|--|
| ODOR | Very strong, Green Leafy, Tomato leaf-like |
| APPEARANCE | Colorless to light yellow |
| NATURAL OCCURRENCE | Found in Tomato, Peppermint, Guava, Navel and Valencia oranges |
| USE | Used as an original fresh natural green top note reminiscent of tomato leaf in a various kinds of flavors and fragrances |
| TENACITY | more than 1 week on a smelling blotter |

PHYSICAL PROPERTIES

| | |
|----------------------|----------------------------------|
| ● Formula | C ₆ H ₁₀ O |
| ● CAS Name | 3-Hexenal,(Z)- |
| ● CAS No. | 6789-80-6 |
| ● UN No. | 1989 |
| ● Flash point | 26°C (closed cup) |

ANALYTICAL SPECIFICATIONS

| | |
|------------------------|-------------|
| ● Purity (GC %) | min. 98.00% |
|------------------------|-------------|

REGISTRATION

| | |
|--|-----------|
| ● TSCA, DSL, CHINA, AICS, PICCS | Listed |
| ● EC No. | 229-854-4 |
| ● FEMA | 2561 |

| | |
|------------------------------|--|
| APPLICATION STABILITY | Stable in weak acid and basic applications. |
| STORAGE CONDITIONS | Store in freezer below -20°C. Purge air in the container with nitrogen. Store away from all heated source, including direct sunlight. Tanks should be grounded and provided with adequate pressure relief value. Storage in stainless steel or polyethylene recommended. |

Leaf acetal



Acetaldehyde ethyl cis-3-hexenyl acetal, known as Leaf acetal, is used as fresh green top notes to give vegetable and fruity scents.

| | |
|---------------------------|---|
| ODOR | Green-grassy, Violet like, Radish-like |
| APPEARANCE | Colorless to pale yellow liquid |
| NATURAL OCCURRENCE | Found in Guava and Plum |
| USE | Used as a natural green top note in floral green and citrus mossy fragrances and also in fruity flavors to give tropical fruits aspects |
| TENACITY | 1 hours on a smelling blotter |

PHYSICAL PROPERTIES

| | |
|----------------------|--|
| ● Formula | C ₁₀ H ₂₀ O ₂ |
| ● CAS Name | 3-Hexene, 1-(1-ethoxyethoxy)-,(Z)- |
| ● CAS No. | 28069-74-1 |
| ● Flash point | 69.5°C (closed cup) |

ANALYTICAL SPECIFICATIONS

| | |
|------------------------------------|-------------|
| ● Purity (GC %) | min. 98.00% |
| ● Specific gravity (d20/20) | 0.849~0.859 |
| ● Refractive index (n20/D) | 1.420~1.430 |
| ● Acid value (mg KOH/g) | max. 2.0 |

REGISTRATION

| | |
|--|-----------|
| ● TSCA, DSL, CHINA, AICS, PICCS | Listed |
| ● EC No. | 248-817-3 |
| ● FEMA | 3775 |

| | |
|------------------------------|---|
| APPLICATION STABILITY | Stable in neutral to weak basic pH applications such as alcoholic, cosmetic and toiletry products |
| STORAGE CONDITIONS | Containers should be kept in a dark cool place after purging air with nitrogen. |

3,6-Nonadienol



3,6-Nonadienol offers the scent of freshly cut Cantaloupe, Honeydew and Watermelon. ZEON CORPORATION has successfully developed the commercial process of manufacturing this product, which has a wide use range in flavor and fragrance.

| | |
|---------------------------|--|
| ODOR | Powerful, Natural, Fresh, Green, Violet leaf, Fruity, Vegetable |
| APPEARANCE | Colorless to pale yellow liquid |
| NATURAL OCCURRENCE | Found in Watermelon, Muskmelon and Cucumber |
| USE | Used in fruity and vegetable flavors as an essential component and also in various fragrances such as marine and ozone notes |
| TENACITY | 2 days on a smelling blotter |

PHYSICAL PROPERTIES

| | |
|----------------------|----------------------------------|
| ● Formula | C ₉ H ₁₆ O |
| ● CAS Name | 3,6-Nonadien-1-ol |
| ● CAS No. | 76649-25-7 |
| ● Flash point | 104°C (open cup) |

ANALYTICAL SPECIFICATIONS

| | |
|---|-------------|
| ● Purity (GC %) | min. 97.00% |
| ● Specific gravity (d₂₀/20) | 0.867~0.875 |
| ● Refractive index (n₂₀/D) | 1.463~1.473 |
| ● Acid value (mg KOH/g) | max. 2.0 |

REGISTRATION

| | |
|---|-----------|
| ● TSCA, DSL, CHINA, ECL, AICS, PICCS | Listed |
| ● EC No. | 278-518-3 |
| ● FEMA | 3885 |
| ● KOSHER | Certified |

| | |
|------------------------------|---|
| APPLICATION STABILITY | Stable in a wide range of applications such as alcoholic, cosmetic, toiletry and household products |
|------------------------------|---|

| | |
|---------------------------|---|
| STORAGE CONDITIONS | Containers should be kept in a dark cool place under 5°C after purging air with nitrogen. |
|---------------------------|---|

cis-6-Nonenol



cis-6-Nonenol offers the scent of Watermelon, Muskmelon and Cucumber, which gives a watery green fresh top note to fruity flavors and also gives ozone and marine notes as a unique accent to aquatic fragrances.

| | |
|---------------------------|---|
| ODOR | Powerful, Natural, Fresh, Fruity Green, Violet leaf, Ozone, Marine |
| APPEARANCE | Colorless to pale yellow liquid |
| NATURAL OCCURRENCE | Found in Watermelon, Muskmelon and Cucumber |
| USE | Used in fruity and vegetable flavors as an essential component and also in various fragrances as marine and ozone fruity notes as well as a violet green note |
| TENACITY | 7 days on a smelling blotter |

PHYSICAL PROPERTIES

| | |
|----------------------|----------------------------------|
| ● Formula | C ₉ H ₁₈ O |
| ● CAS Name | 6-Nonen-1-ol, (Z)- |
| ● CAS No. | 35854-86-5 |
| ● Flash point | 95°C (open cup) |

ANALYTICAL SPECIFICATIONS

| | |
|---|-------------|
| ● Purity (GC %) | min. 95.00% |
| ● Specific gravity (d₂₀/20) | 0.846~0.854 |
| ● Refractive index (n₂₀/D) | 1.444~1.456 |
| ● Acid value (mg KOH/g) | max. 2.0 |

REGISTRATION

| | |
|---|-----------|
| ● TSCA, DSL, CHINA, ECL, AICS, PICCS | Listed |
| ● EC No. | 252-764-1 |
| ● FEMA | 3465 |
| ● KOSHER | Certified |

| | |
|------------------------------|---|
| APPLICATION STABILITY | Stable in a wide range of applications such as alcoholic, cosmetic, toiletry and household products |
| STORAGE CONDITIONS | Containers should be kept in a dark cool place under 5°C after purging air with nitrogen. |



CLAIGEON™ (Methyl dihydrojasmonate) is an aroma chemical essential for today's fragrance compounds widely used in fine fragrance, cosmetics, toiletries and household products.

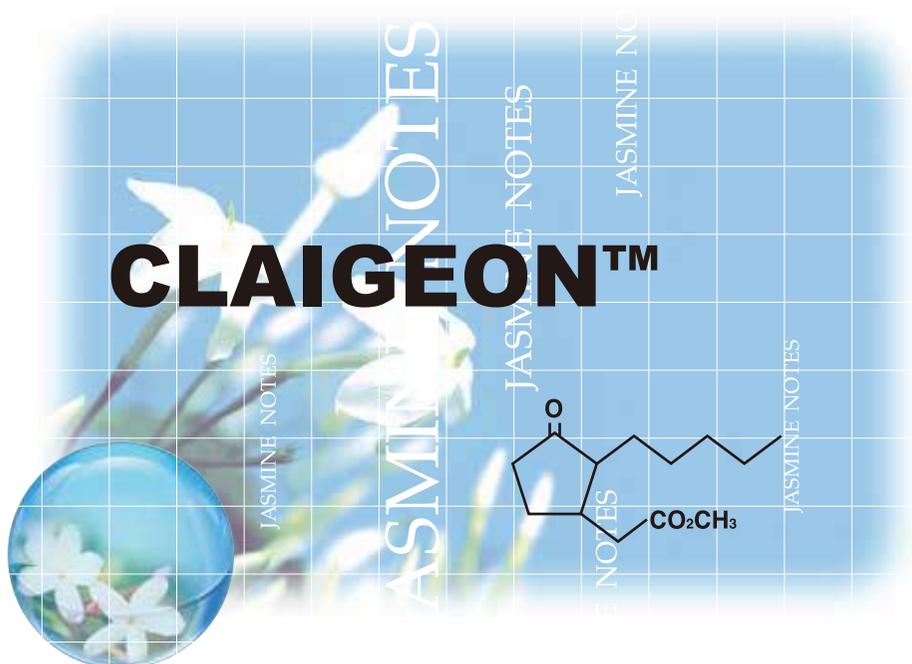
CEPIONATE™ (highly epimerized Methyl dihydrojasmonate) contains three times of epi-isomer(30~35%) compared to regular Methyl dihydrojasmonate.

Jasminlactone gives the highest quality of fruity lactone note to compounds.

JASMONEIGE™ (Methyl jasmonate) and

ZEPPIN™ (highly epimerized Methyl jasmonate) are very popular for their distinctive effects in various applications.

ZEON's AROMA CHEMICALS
EMOSCENT®



CLAIGEON™ is ZEON CORPORATION's original brand for Methyl dihydrojasmonate, and has now become a major aroma chemical. With its wide range of uses, mainly in fragrances, it can be also used in flavors compounds with a nuance of citrus and tea flavor.

| | |
|---------------------------|---|
| ODOR | Floral, Natural Jasmine-like |
| APPEARANCE | Colorless to pale yellow liquid |
| NATURAL OCCURRENCE | Found in Jasmine, Tea and Heliotropium |
| USE | Used in numerous types of fragrances to create a natural floral atmosphere as well as in citrus and tea flavors |
| TENACITY | more than 2 weeks on a smelling blotter |

PHYSICAL PROPERTIES

| | |
|----------------------|--|
| ● Formula | C ₁₃ H ₂₂ O ₃ |
| ● CAS Name | Cyclopentaneacetic acid, 3-oxo-2-pentyl-, methyl ester |
| ● CAS No. | 24851-98-7 |
| ● Flash point | 160°C (open cup) |

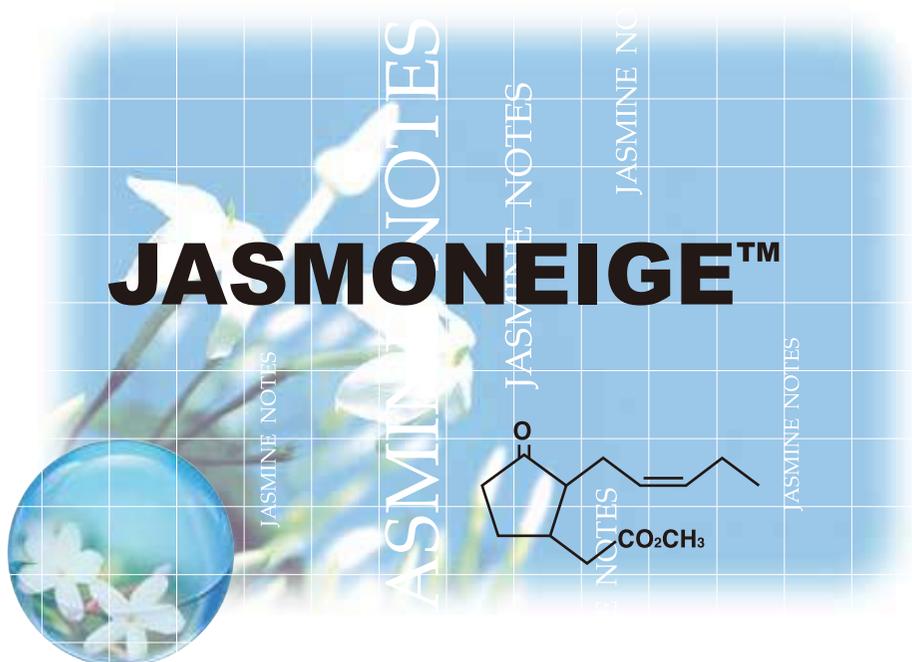
ANALYTICAL SPECIFICATIONS

| | |
|---|-------------|
| ● Purity (GC %) | min. 98.50% |
| ● Specific gravity (d₂₀/20) | 0.999~1.007 |
| ● Refractive index (n₂₀/D) | 1.456~1.462 |
| ● Acid value (mg KOH/g) | max. 1.0 |

REGISTRATION

| | |
|---|-----------|
| ● TSCA, DSL, CHINA, ECL, AICS, PICCS | Listed |
| ● EC No. | 246-495-9 |
| ● FEMA | 3408 |

| | |
|------------------------------|---|
| APPLICATION STABILITY | Stable in a wide range of applications such as alcoholic, cosmetic, toiletry and household products |
| STORAGE CONDITIONS | Containers should be kept in a dark cool place after purging air with nitrogen. |



JASMONEIGE™, ZEON CORPORATION's original brand for Methyl jasmonate, is a nature identical substance existing in Jasmine, which gives distinctive characteristics in various fragrances and flavor compounds.

| | |
|---------------------------|---|
| ODOR | Powerful, Floral, Sweet, Elegant Reminiscent of Natural Jasmine petal |
| APPEARANCE | Colorless to pale yellow liquid |
| NATURAL OCCURRENCE | Found in Jasmine, Peppermint, Spearmint and Tea |
| USE | Used as a soft, elegant Jasmine-like note in both fragrance and flavor compounds to add richness and luxury and to create a long lasting, exciting effect; also used in various flavors |
| TENACITY | more than 2 weeks on a smelling blotter |

PHYSICAL PROPERTIES

| | |
|----------------------|---|
| ● Formula | C ₁₃ H ₂₀ O ₃ |
| ● CAS Name | Cyclopentaneacetic acid, 3-oxo-2-(2-pentenyl)-, methyl ester,(Z)- |
| ● CAS No. | 39924-52-2 |
| ● Flash point | 156°C (open cup) |

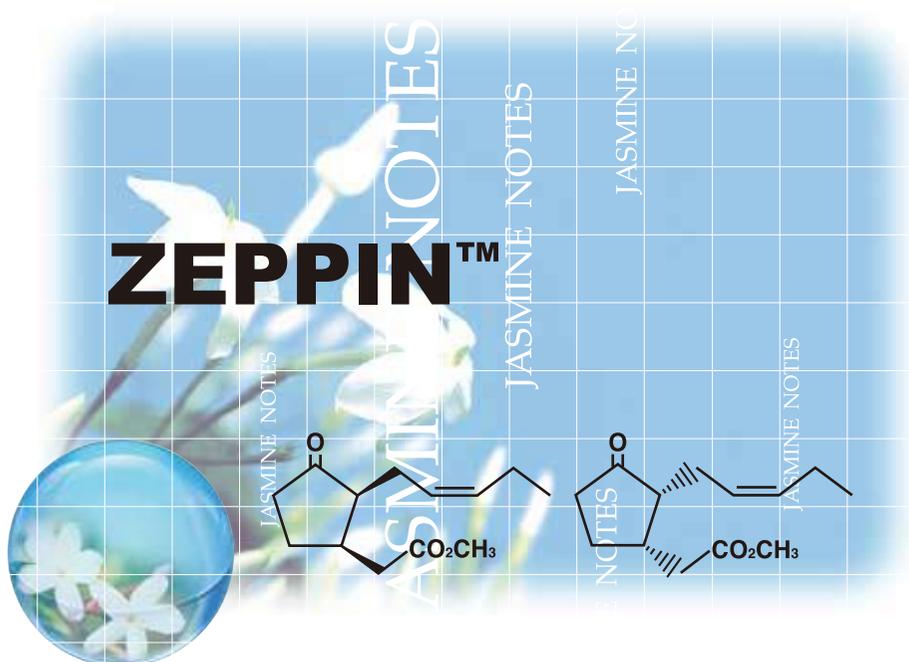
ANALYTICAL SPECIFICATIONS

| | |
|------------------------------------|-------------|
| ● Purity (GC %) | min. 97.00% |
| ● Specific gravity (d20/20) | 1.018~1.029 |
| ● Refractive index (n20/D) | 1.471~1.477 |
| ● Acid value (mg KOH/g) | max. 2.0 |

REGISTRATION

| | |
|---|-----------|
| ● TSCA, DSL, CHINA, ECL, AICS, PICCS | Listed |
| ● EC No. | 254-705-5 |
| ● FEMA | 3410 |
| ● KOSHER | Certified |

| | |
|------------------------------|---|
| APPLICATION STABILITY | Stable in a wide range of applications such as alcoholic, cosmetic, toiletry and household products |
| STORAGE CONDITIONS | Containers should be kept in a dark cool place under 5°C after purging air with nitrogen. |



ZEPPIN™ is highly epimerized Methyl jasmonate, which has about five times more epi-isomer than **JASMONEIGE™**. This allows even a small amount of **ZEPPIN™** in compounds to create significant effects and performance. The threshold of Methyl epi-jasmonate is less than one thousandth of that of the other isomer.

| | |
|---------------------------|---|
| ODOR | Very natural, Diffusive, Floral, Sweet, Reminiscent of Natural Jasmine petal |
| APPEARANCE | Colorless to pale yellow liquid |
| NATURAL OCCURRENCE | Found in Jasmine, Peppermint, Spearmint and Tea |
| USE | Used in white floral fragrance such as Jasmine, Lily, Gardenia and Honeysuckle also useful for flavors such as Tea, Lemon and various kinds of fruits to add a noble and gorgeous scent |
| TENACITY | 4 days on a smelling blotter |

PHYSICAL PROPERTIES

| | |
|----------------------|---|
| ● Formula | C ₁₃ H ₂₀ O ₃ |
| ● CAS Name | Cyclopentaneacetic acid, 3-oxo-2-(2-pentenyl)-, methyl ester,(Z)- |
| ● CAS No. | 39924-52-2 |
| ● Flash point | 156°C (open cup) |

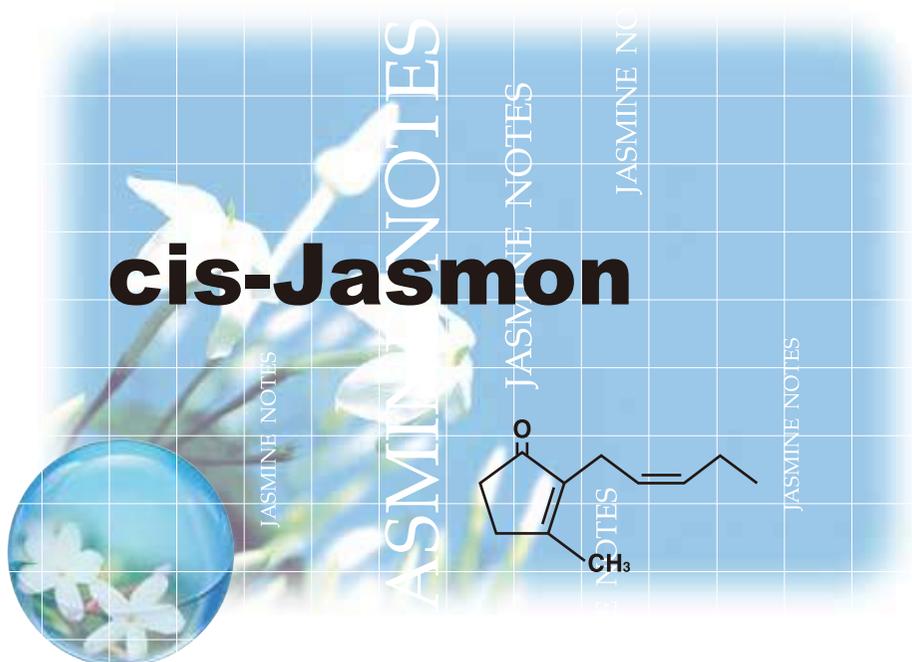
ANALYTICAL SPECIFICATIONS

| | |
|------------------------------------|--|
| ● Purity (GC %) | min. 97.00%(containing epi-isomer 20.00%~23.00%) |
| ● Specific gravity (d20/20) | 1.018~1.029 |
| ● Refractive index (n20/D) | 1.471~1.477 |
| ● Acid value (mg KOH/g) | max. 2.0 |

REGISTRATION

| | |
|---|-----------|
| ● TSCA, DSL, CHINA, ECL, AICS, PICCS | Listed |
| ● EC No. | 254-705-5 |
| ● FEMA | 3410 |
| ● KOSHER | Certified |

| | |
|------------------------------|--|
| APPLICATION STABILITY | Stable in a neutral to weak acidic pH applications such as alcoholic, cosmetic products. |
| RECOMMENDATIONS | <ul style="list-style-type: none"> ● Use in neutral or weak acidic applications. ● Avoid using in strong acidic or basic applications. ● Check stability in each final product. |
| STORAGE CONDITIONS | Containers should be kept in a dark cool place under 5°C after purging air with nitrogen. |



cis-Jasmon is a nature identical substance existing in mint, tea and various flowers. cis-Jasmon is widely used in floral fragrances to create natural flower note, also used in various flavors such as Jasmine tea, Strawberry, Pineapple and mint flavors.

| | |
|---------------------------|---|
| ODOR | Diffusive, Fruity, Natural Jasmine-like, Celery seed-like |
| APPEARANCE | Colorless to pale yellow liquid |
| NATURAL OCCURRENCE | Found in Jasmine, Peppermint, Spearmint, Jonquil Bergamot and tea |
| USE | Used in floral fragrances and in fresh fruity flavors such as Strawberry, Pineapple, Tea and Mint types |
| TENACITY | 7 days on a smelling blotter |

PHYSICAL PROPERTIES

| | |
|----------------------|--|
| ● Formula | C ₁₁ H ₁₆ O |
| ● CAS Name | 2-Cyclopenten-1-one, 3-methyl-2-(2-pentenyl), (Z)- |
| ● CAS No. | 488-10-8 |
| ● Flash point | 127.5°C (open cup) |

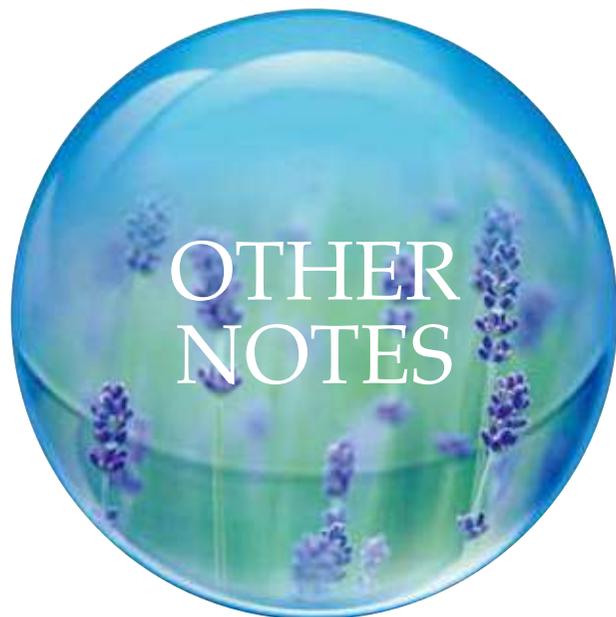
ANALYTICAL SPECIFICATIONS

| | |
|------------------------------------|-------------|
| ● Purity (GC %) | min. 98.00% |
| ● Specific gravity (d20/20) | 0.940~0.946 |
| ● Refractive index (n20/D) | 1.497~1.501 |
| ● Acid value (mg KOH/g) | max. 2.0 |

REGISTRATION

| | |
|---|-----------|
| ● TSCA, DSL, CHINA, ECL, AICS, PICCS | Listed |
| ● EC No. | 207-668-4 |
| ● FEMA | 3196 |

| | |
|------------------------------|---|
| APPLICATION STABILITY | Stable in a wide range of applications such as alcoholic, cosmetic, toiletry and household products |
| STORAGE CONDITIONS | Containers should be kept in a dark cool place under 5°C after purging air with nitrogen. |



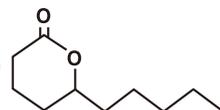
We have specific lactones as other notes such as delta-Decalactone, delta-Undecalactone, delta-Dodecalactone and the optically active delta-Decalactone which are widely used in flavor and fragrance compounds to create buttery, nutty and fruity notes.

ZEON's AROMA CHEMICALS
EMOSCENT®

Delta lactones are popularly used in milky, buttery and fruity flavors to create natural odors and tastes, also used in fragrances to add fruity rich notes.



delta-Decalactone



| | |
|---------------------------|--|
| ODOR | Powerful, Creamy, Nutty, Sweet, Fruity |
| NATURAL OCCURRENCE | Butter, Milk, Cream, Peach, Gardenia, Tuberose |
| TENACITY | more than 2 weeks on a smelling blotter |

PHYSICAL PROPERTIES

| | |
|----------------------|--|
| ● Formula | C ₁₀ H ₁₈ O ₂ |
| ● CAS Name | 2-H-Pyran-2-one, tetrahydro-6-pentyl- |
| ● CAS No. | 705-86-2 |
| ● Flash point | 148°C (open cup) |

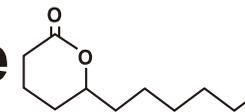
ANALYTICAL SPECIFICATIONS

| | |
|------------------------------------|-------------|
| ● Purity (GC %) | min. 98.00% |
| ● Specific gravity (d20/20) | 0.969~0.975 |
| ● Refractive index (n20/D) | 1.456~1.460 |
| ● Acid value (mg KOH/g) | max. 5.0 |

REGISTRATION

| | |
|--|-----------|
| ● TSCA,DSL,CHINA,ECL,AICS,PICCS | Listed |
| ● EC No. | 211-889-1 |
| ● FEMA | 2361 |

delta-Undecalactone



| | |
|---------------------------|---|
| ODOR | Fatty, Creamy, Peach-like |
| NATURAL OCCURRENCE | Butter, Milk, Cream |
| TENACITY | more than 2 weeks on a smelling blotter |

PHYSICAL PROPERTIES

| | |
|----------------------|--|
| ● Formula | C ₁₁ H ₂₀ O ₂ |
| ● CAS Name | 2-H-Pyran-2-one, 6-hexyl tetrahydro- |
| ● CAS No. | 710-04-3 |
| ● Flash point | 159°C (open cup) |

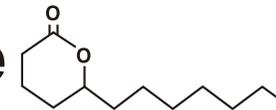
ANALYTICAL SPECIFICATIONS

| | |
|------------------------------------|-------------|
| ● Purity (GC %) | min. 98.00% |
| ● Specific gravity (d20/20) | 0.958~0.964 |
| ● Refractive index (n20/D) | 1.456~1.461 |
| ● Acid value (mg KOH/g) | max. 5.0 |

REGISTRATION

| | |
|--|-----------|
| ● TSCA,DSL,CHINA,ECL,AICS,PICCS | Listed |
| ● EC No. | 211-915-1 |
| ● FEMA | 3294 |

delta-Dodecalactone



| | |
|---------------------------|--|
| ODOR | Powerful, Fresh, Fruity, Milky |
| NATURAL OCCURRENCE | Butter, Milk, Cream, Peach, Gardenia, Tuberose |
| TENACITY | more than 2 weeks on a smelling blotter |

PHYSICAL PROPERTIES

| | |
|----------------------|--|
| ● Formula | C ₁₂ H ₂₂ O ₂ |
| ● CAS Name | 2-H-Pyran-2-one, 6-heptyl tetrahydro- |
| ● CAS No. | 713-95-1 |
| ● Flash point | 171°C (open cup) |

ANALYTICAL SPECIFICATIONS

| | |
|------------------------------------|-------------|
| ● Purity (GC %) | min. 98.00% |
| ● Specific gravity (d20/20) | 0.948~0.954 |
| ● Refractive index (n20/D) | 1.457~1.462 |
| ● Acid value (mg KOH/g) | max. 5.0 |

REGISTRATION

| | |
|--|-----------|
| ● TSCA,DSL,CHINA,ECL,AICS,PICCS | Listed |
| ● EC No. | 211-932-4 |
| ● FEMA | 2401 |

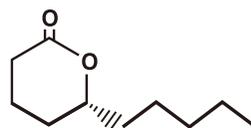
Delta LACTONES, which naturally occur in many kinds of foods, are indispensable for creating various flavor and fragrance compounds.

Many flavor and fragrance components have chiral structures, which show optical activity, and well-known that the odor quality of optically active substances is much superior to that of racemic compounds.

ZEON CORPORATION has successfully developed the synthetic process of manufacturing the optically active delta-Decalactone and commercially launched enantiomer, R-body. Using the optically active delta-Decalactone in compounds makes it possible to reproduce really natural flavors and fragrances that have been impossible to create only with racemic compounds.



The optically active delta-Decalactone R-80



PHYSICAL PROPERTIES

| | |
|--------------|--|
| ●Formula | C ₁₀ H ₁₈ O ₂ |
| ●CAS No. | 705-86-2 |
| ●Flash point | 148°C (open cup) |

ANALYTICAL SPECIFICATIONS

| | |
|---|---------------|
| ●Purity (GC %) | min. 98.00% |
| ●Optical purity (ee) | 80.0~83.0% ee |
| ●Specific gravity (d ₂₀ /20) | 0.969~0.975 |
| ●Refractive index (n ₂₀ /D) | 1.455~1.460 |
| ●Acid value (mg KOH/g) | max. 5.0 |

REGISTRATION

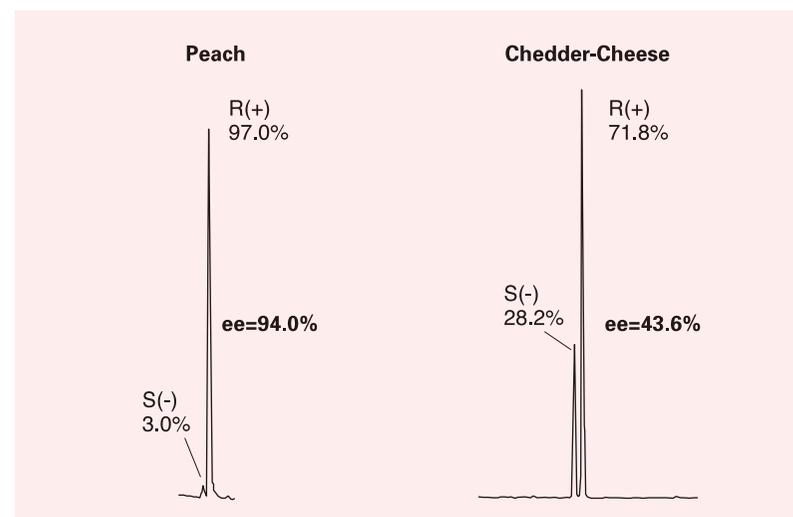
| | |
|--------------------------------|-----------|
| ●TSCA,DSL,CHINA,ECL,AICS,PICCS | Listed |
| ●EC No. | 211-889-1 |
| ●FEMA | 2361 |

ee : enantiomeric excess

| | |
|-------------------------|---|
| ODOR | Natural, milky, creamy |
| NATURAL OCCURRENCE R-80 | Cheese, Peach |
| TENACITY R-80 | more than 2 weeks on a smelling blotter |

Stereodifferentiation of delta-Decalactone in natural products

| Food | R : S (%) |
|----------------|-----------------------|
| Cheddar cheese | 71.8 : 28.2 (43.6%ee) |
| Osmanthus oil | 83.8 : 16.2 (67.6%ee) |
| Peach | 97.0 : 3.0 (94.0%ee) |



*Z.Lebensm.-Unters.Forsch.(1993)196;307-328

ZEON's AROMA CHEMICALS DATA

GREEN NOTES

| PRODUCT NAME | FORMULA | CAS No. | UN No. | TSCA,DSL,CHINA, AICS,PICCS | EC No. | FEMA | | H.S. No. | ENCS (JAPAN) | SPECIFIC GRAVITY(d ₂₀ ²⁰) | REFRACTIVE INDEX(n _D ²⁰) | PURITY (GC%) | ODOR |
|---------------------------------|--|------------|--------|-------------------------------|-----------|------|--|----------|-----------------|---|--|-----------------|---|
| cis-3-Hexenol (Leaf alcohol) | C ₆ H ₁₂ O | 928-96-1 | 1987 | Listed | 213-192-8 | 2563 | | 2905.29 | 2-2393 | 0.845~0.851 | 1.436~1.442 | min. 98.00 | Fresh and Natural Green, Grassy, Powerful |
| cis-3-Hexenyl acetate | C ₈ H ₁₄ O ₂ | 3681-71-8 | 3272 | Listed | 222-960-1 | 3171 | | 2915.39 | 2-2533 | 0.898~0.904 | 1.424~1.430 | min. 98.00 | Fruity, Green,Apple, Green banana-like |
| cis-3-Hexenyl salicylate | C ₁₃ H ₁₆ O ₃ | 65405-77-8 | 3082 | Listed | 265-745-8 | 4750 | | 2918.23 | 3-3041 | 1.059~1.067 | 1.518~1.525 | min. 97.00 | Floral, Green, Balsamic |
| cis-3-Hexenal | C ₆ H ₁₀ O | 6789-80-6 | 1989 | Listed | 229-854-4 | 2561 | | 2912.19 | 2-520 | ——— | ——— | min. 98.00 | Very strong, Green Leafy, Tomato leaf-like |
| Leaf acetal | C ₁₀ H ₂₀ O ₂ | 28069-74-1 | N/A | Listed | 248-817-3 | 3775 | | 2911.00 | 2-2458 | 0.849~0.859 | 1.420~1.430 | min. 98.00 | Green-grassy, Violet like, Radish-like |
| 3,6-Nonadienol | C ₈ H ₁₆ O | 76649-25-7 | N/A | Listed | 278-518-3 | 3885 | | 2905.29 | 2-258 | 0.867~0.875 | 1.463~1.473 | min. 97.00 | Powerful, Natural, Fresh, Green, Violet leaf, Fruity, Vegetable |
| cis-6-Nonenol | C ₉ H ₁₈ O | 35854-86-5 | N/A | Listed | 252-764-1 | 3465 | | 2905.29 | 2-258 | 0.846~0.854 | 1.444~1.456 | min. 95.00 | Powerful, Natural, Fresh, Fruity Green, Violet leaf, Ozone |

ZEON's AROMA CHEMICALS DATA

JASMINE NOTES

| PRODUCT NAME | FORMULA | CAS No. | UN No. | TSCA,DSL,CHINA, AICS,PICCS | EC No. | FEMA | H.S. No. | ENCS (JAPAN) | SPECIFIC GRAVITY(d ₂₀) | REFRACTIVE INDEX(n _D ²⁰) | PURITY (GC%) | ODOR |
|---|--|------------|--------|-------------------------------|-----------|------|----------|-----------------|---------------------------------------|--|-------------------------------|---|
| CLAIGEON™ (Methyl dihydrojasmonate) | C ₁₃ H ₂₂ O ₃ | 24851-98-7 | N/A | Listed | 246-495-9 | 3408 | 2918.30 | 3-3309 | 0.999~1.007 | 1.456~1.462 | min. 98.50 | Floral, Natural Jasmine-like |
| CEPIONATE™ (Methyl epi-dihydrojasmonate) | C ₁₃ H ₂₂ O ₃ | 24851-98-7 | N/A | Listed | 246-495-9 | 3408 | 2918.30 | 3-3309 | 1.000~1.008 | 1.456~1.462 | min. 98.00 epi-30.00~35.00 | Powerful, Floral, Sweet Tenacious, Slightly powdery, Diffusive, Natural Jasmine-like |
| Jasminlactone | C ₁₀ H ₁₆ O ₂ | 25524-95-2 | N/A | Listed | 247-074-2 | 3745 | 2932.20 | 5-6352 | 0.995~1.007 | 1.473~1.479 | min. 97.00 | Powerful, Very natural, Oily-fruity, Tenacious, White flower petals |
| JASMONEIGE™ (Methyl jasmonate) | C ₁₃ H ₂₀ O ₃ | 39924-52-2 | N/A | Listed | 254-705-5 | 3410 | 2918.30 | 3-3839 | 1.018~1.029 | 1.471~1.477 | min. 97.00 | Powerful, Floral, Sweet, Elegant, Reminiscent of Natural Jasmine petal |
| ZEPPIN™ (Methyl epi-jasmonate) | C ₁₃ H ₂₀ O ₃ | 39924-52-2 | N/A | Listed | 254-705-5 | 3410 | 2918.30 | 3-3839 | 1.018~1.029 | 1.471~1.477 | min. 97.00 epi-20.00~23.00 | Very natural, Diffusive, Floral, Sweet Reminiscent of Natural Jasmine petal |
| cis-Jasmon | C ₁₁ H ₁₆ O | 488-10-8 | N/A | Listed | 207-668-4 | 3196 | 2914.29 | 3-2394 | 0.940~0.946 | 1.497~1.501 | min. 98.00 | Diffusive, Fruity, Natural Jasmine-like, Celery seed-like |

OTHER NOTES

| PRODUCT NAME | FORMULA | CAS No. | UN No. | TSCA,DSL,CHINA, AICS,PICCS | EC No. | FEMA | H.S. No. | ENCS (JAPAN) | SPECIFIC GRAVITY(d ₂₀) | REFRACTIVE INDEX(n _D ²⁰) | PURITY (GC%) | ODOR |
|------------------------|--|-----------|--------|-------------------------------|-----------|------|----------|-----------------|---------------------------------------|--|-----------------------------|---|
| Prenyl acetate | C ₇ H ₁₂ O ₂ | 1191-16-8 | 1993 | Listed | 214-730-4 | 4202 | 2915.39 | 2-2532 | 0.917~0.922 | 1.428~1.433 | min. 98.00 | Fruity, Green apple / banana-like |
| delta-Decalactone | C ₁₀ H ₁₈ O ₂ | 705-86-2 | N/A | Listed | 211-889-1 | 2361 | 2932.29 | 5-698 | 0.969~0.975 | 1.456~1.460 | min. 98.00 | Powerful, Creamy, Nutty, Sweet, Fruity |
| delta-Undecalactone | C ₁₁ H ₂₀ O ₂ | 710-04-3 | N/A | Listed | 211-915-1 | 3294 | 2932.29 | 5-698 | 0.958~0.964 | 1.456~1.461 | min. 98.00 | Fatty, Creamy, Peach-like |
| delta-Dodecalactone | C ₁₂ H ₂₂ O ₂ | 713-95-1 | N/A | Listed | 211-932-4 | 2401 | 2932.29 | 5-698 | 0.948~0.954 | 1.457~1.462 | min. 98.00 | Powerful, Fresh, Fruity, Milky |
| delta-Decalactone R-80 | C ₁₀ H ₁₈ O ₂ | 705-86-2 | N/A | Listed | 211-889-1 | 2361 | 2932.29 | 5-698 | 0.969~0.975 | 1.455~1.460 | min. 98.00 80.0~83.0% ee | Natural, Milky, Creamy |



FOR MORE INFORMATION

It is our pleasure to serve customers with high quality products, technologies and the best services possible.

If you have any questions about our aroma chemicals or have any interest in further information or samples, please contact as follows;

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