



100th ANNIVERSARY
SODA AROMATIC Co., Ltd.

MACROCYCLIC MUSK

POLVOLIDE[®]

SODA's NEW Raw Materials information

SODA AROMATIC Co., Ltd.

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NEW MACROCYCLIC MUSK

What is **POLVOLIDE**®?

- The introduction of a new synthetic musk that has many advantages.
- Even people who are not interested in perfume have almost certainly heard of “musk”. Many different ingredients can be used to create perfumes, but musk is an ingredient with a top-class level of recognition and popularity. We shall now look at both the history and the present market situation of musk, topics that are fundamental to any discussion of perfume.

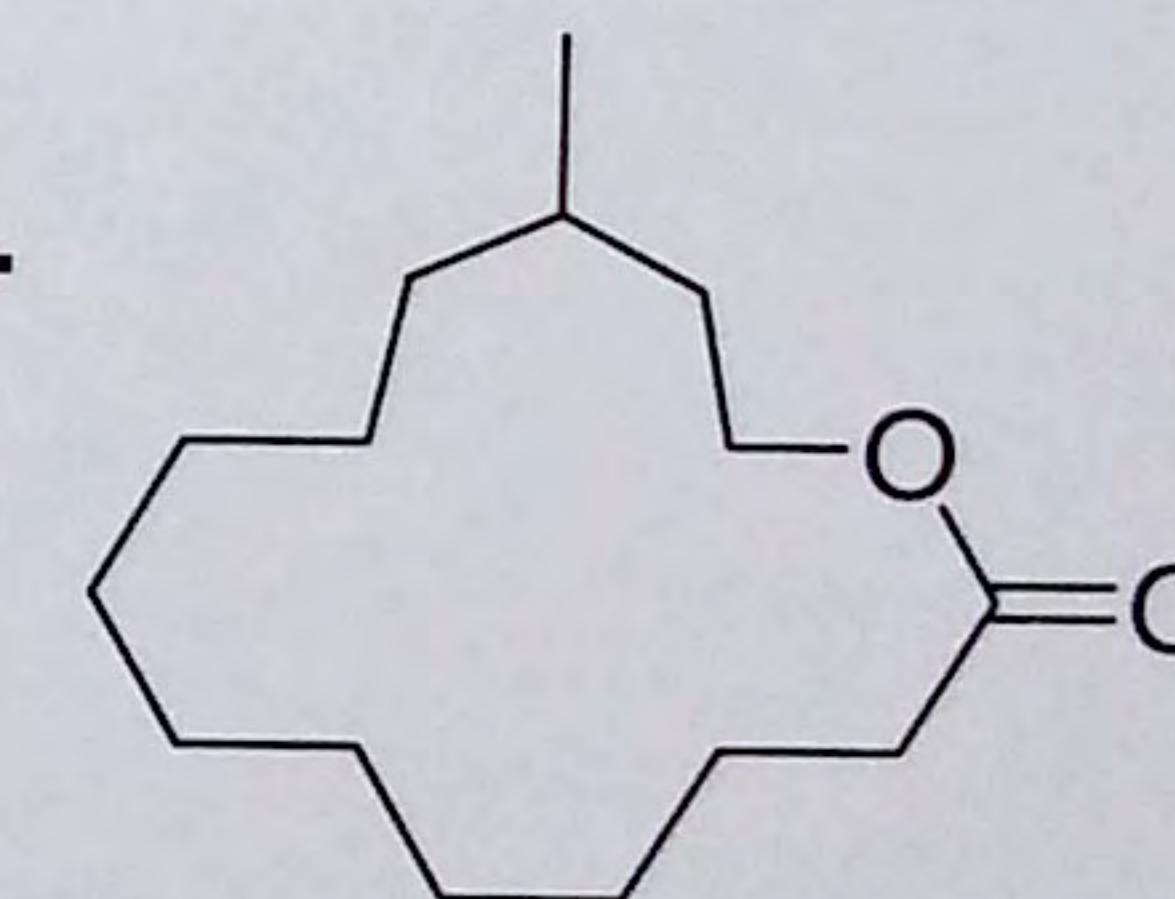
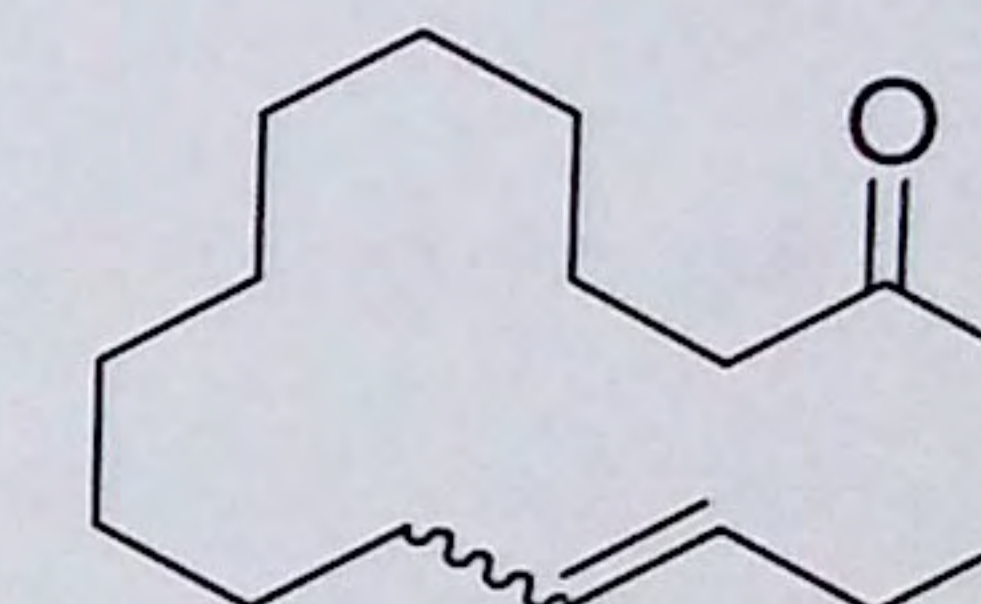
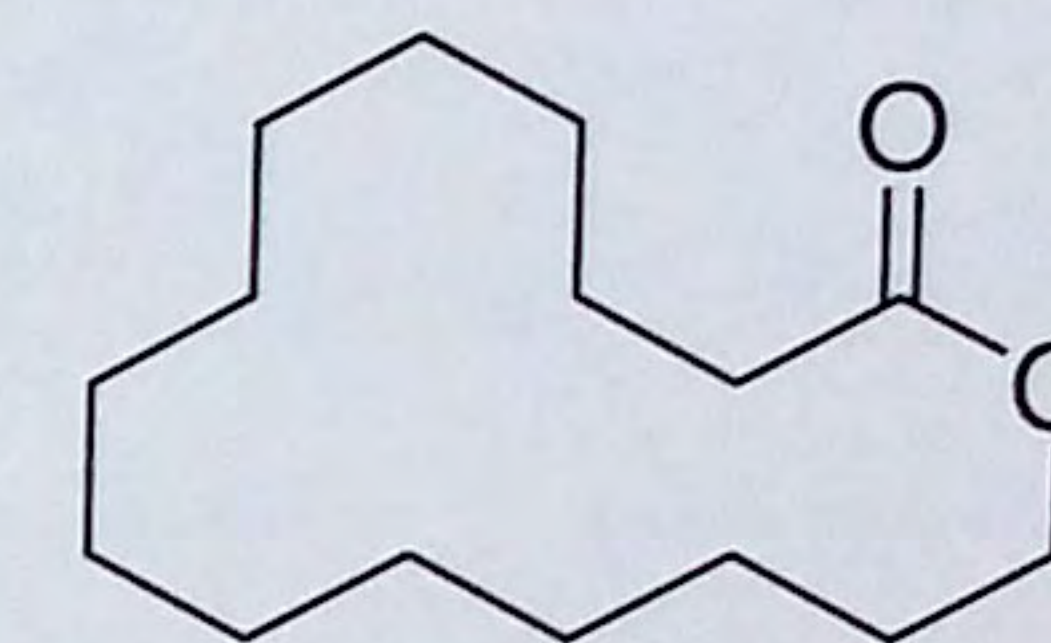
1. The history and the present market situation of musk
2. The **odor characteristics** of **POLVOLIDE**® & Its **effects** in compounds
3. Demonstration formulas
4. A short review of its odor profile

The history and the present market situation of musk

- A synthetic musk which has attracted attention as an alternative to animal derivatives

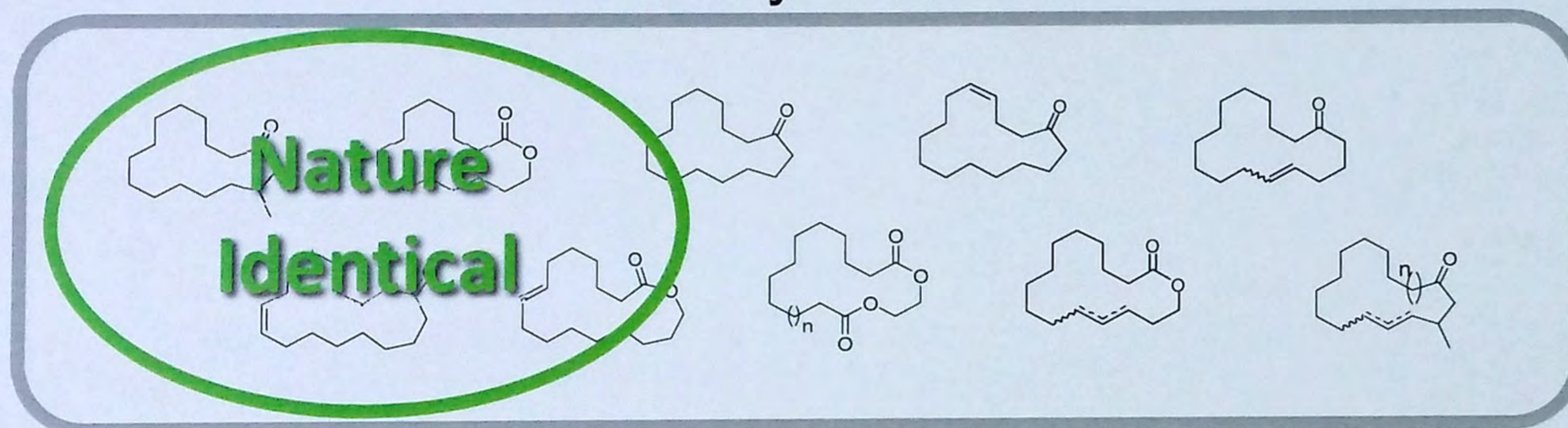


Since the discovery of nitro-musk in the 1890s, many different synthetic musks have appeared on the market. Many different products, from perfume through to detergents, make use of these fragrances, and people therefore have a familiarity with the fragrance of this ingredient due to their contact with it in everyday life.



The history and the present market situation of musk

Macrocyclic Musk

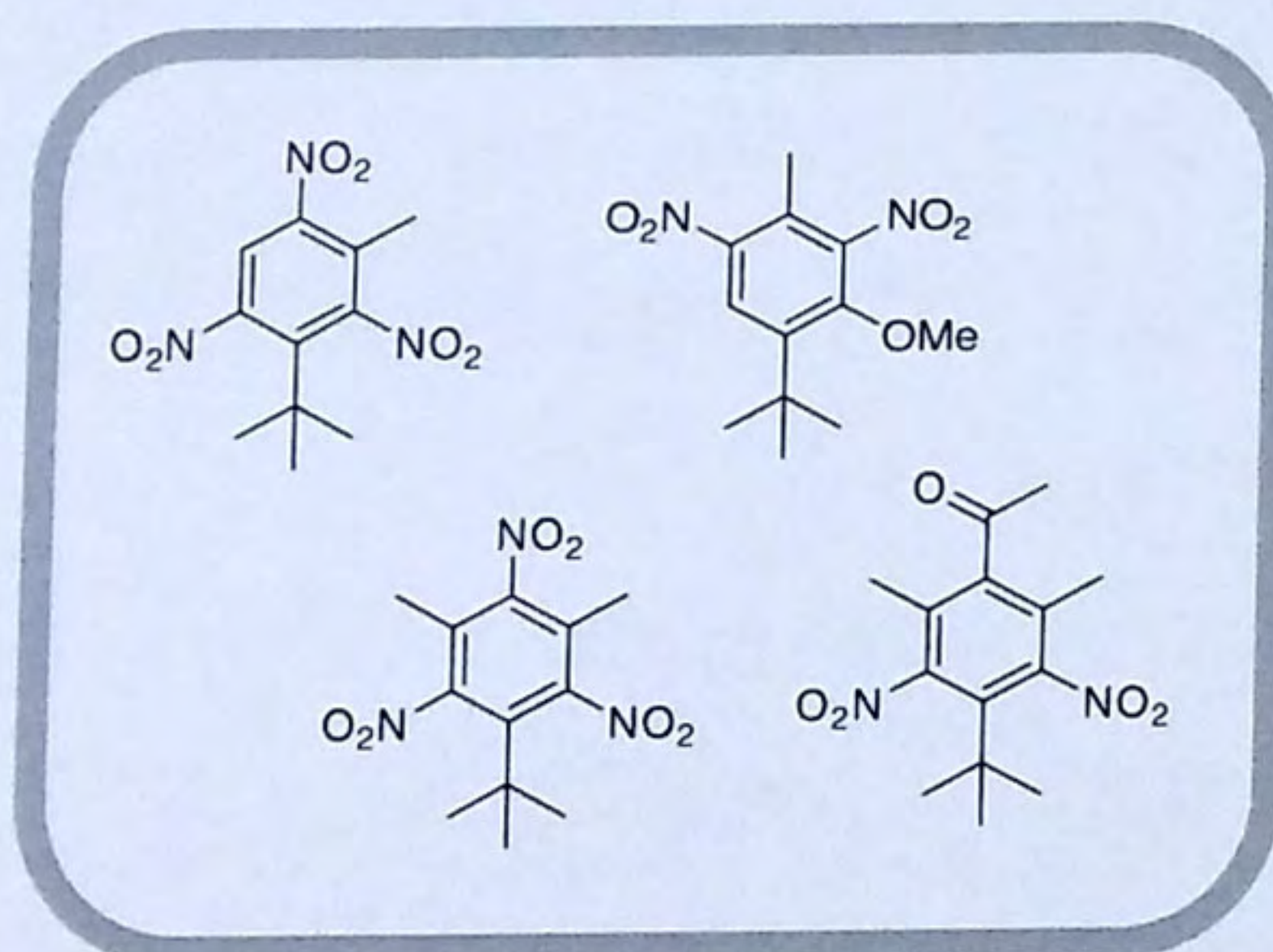


A new trend in musks

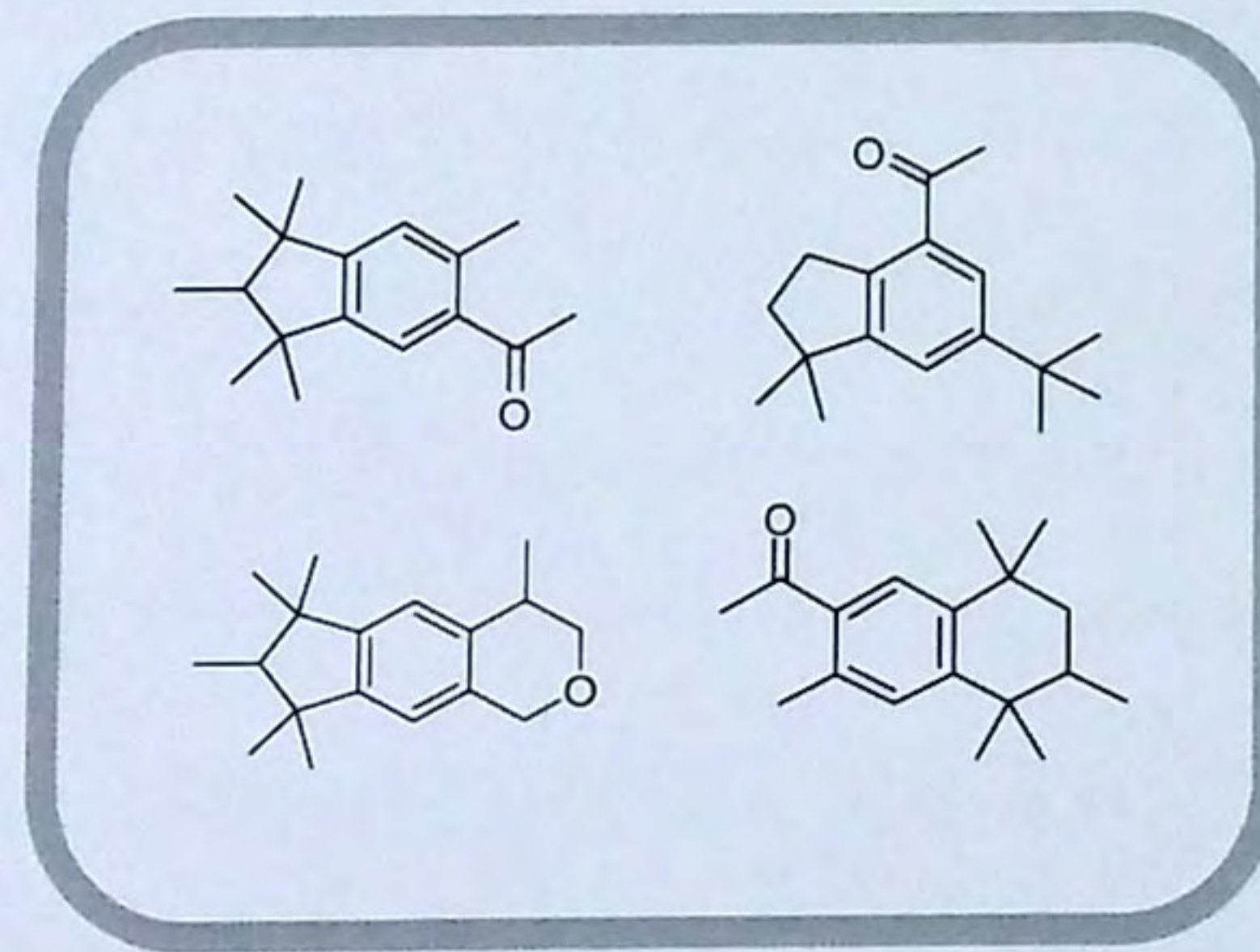
As a response to the needs of the market, the focus shifted to macrocyclic musk, which is highly biodegradable and is similar to the natural form of musk.

Alicyclic musk, which has the image of possessing an additional fruity fragrance, is sometimes suggested as being a new trend in synthetic musk, but, at present, the synthetic musk market is focused upon macrocyclic musk, which is kind to the environment and has many different variations.

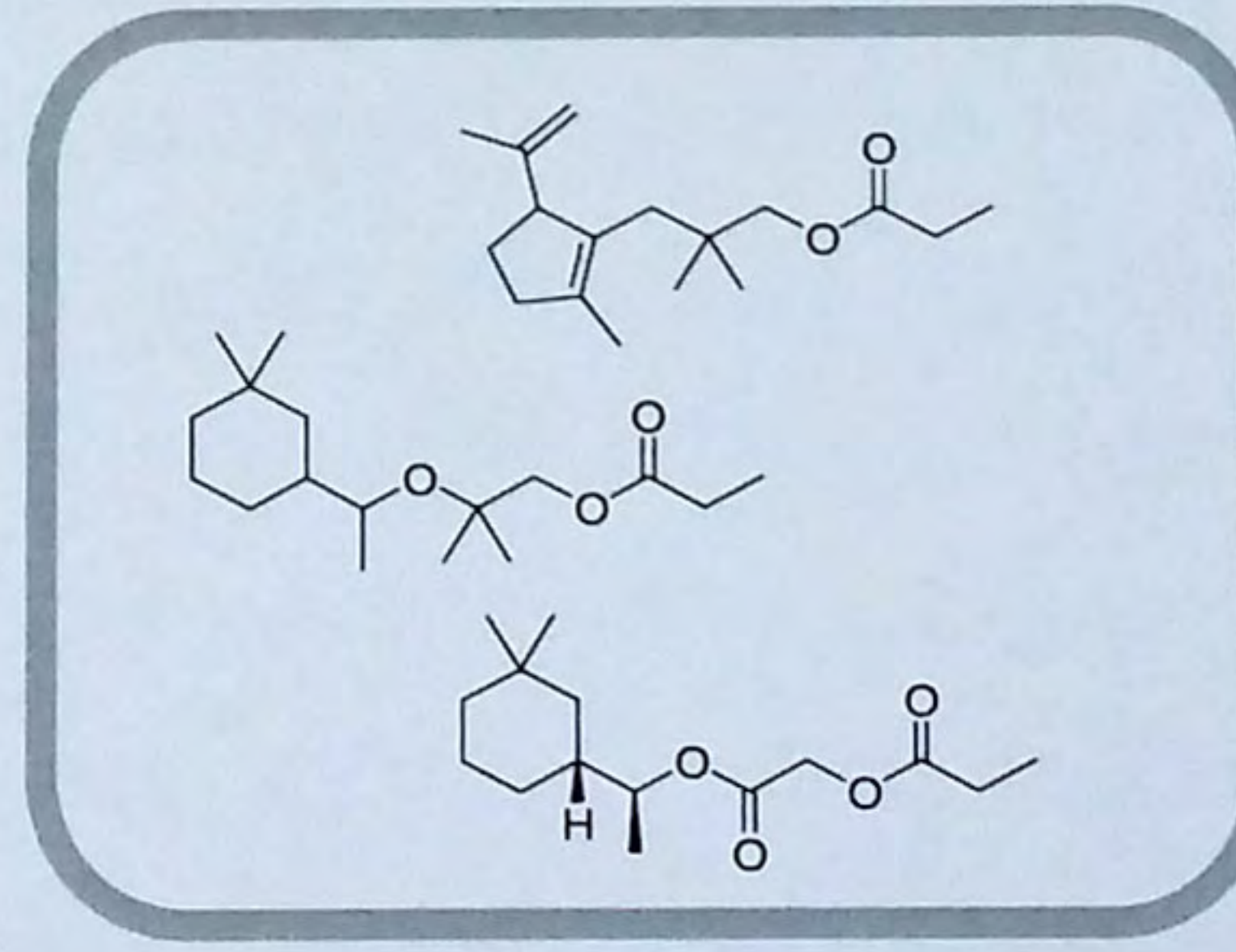
Nitro Musk



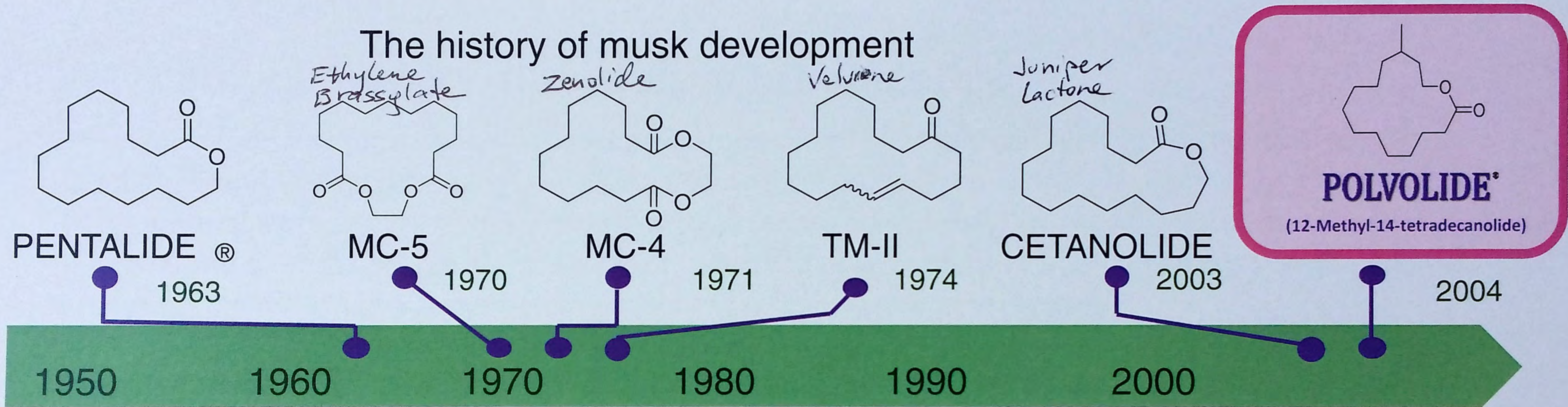
Polycyclic Musk



Alicyclic Musk



The history of Soda's Musk Development and the present market situation of musk



- **Attention is focused on environmentally friendly synthetic musk**

The history of musk-based perfumes is a story of improvement, as features that the musk did not originally possess are added to it. The main component of natural musk has a macrocyclic structure.

The first one to attract attention was nitro-musk. This is a compound with the structure of a benzene ring with nitrogen dioxide attached to it. But, for reasons such as safety, and environmental impact, the use of most nitro-musk has been banned. As a replacement, attention was then focused on polycyclic musk, which has a superior level of safety and stability. However, with the increasing level of concern for the environment, the need for a new musk that is environmentally friendly is also increasing.

The history and the present market situation of musk

- **We want a powdery, diffusible synthetic musk!**

The market then began to demand that the environmentally friendly and highly popular macrocyclic musk should be improved by becoming more powdery and diffusible.

There are many aspects to synthetic musk, such as “sharp freshness”, “softness”, an “animalistic powdery” element, and a “diffusible powdery” element, but up to now there have been few macrocyclic musks with a focus on the diffusible powdery element; there were not enough variations.

The term “powdery” refers to the fragrance that is possessed by Japanese style face powder, or perhaps the fragrance that comes off laundry that has been hung out to dry in the sun. It is a fragrance with a refreshing, clean feel to it, comfortable for the nose, and popular with Japanese people.

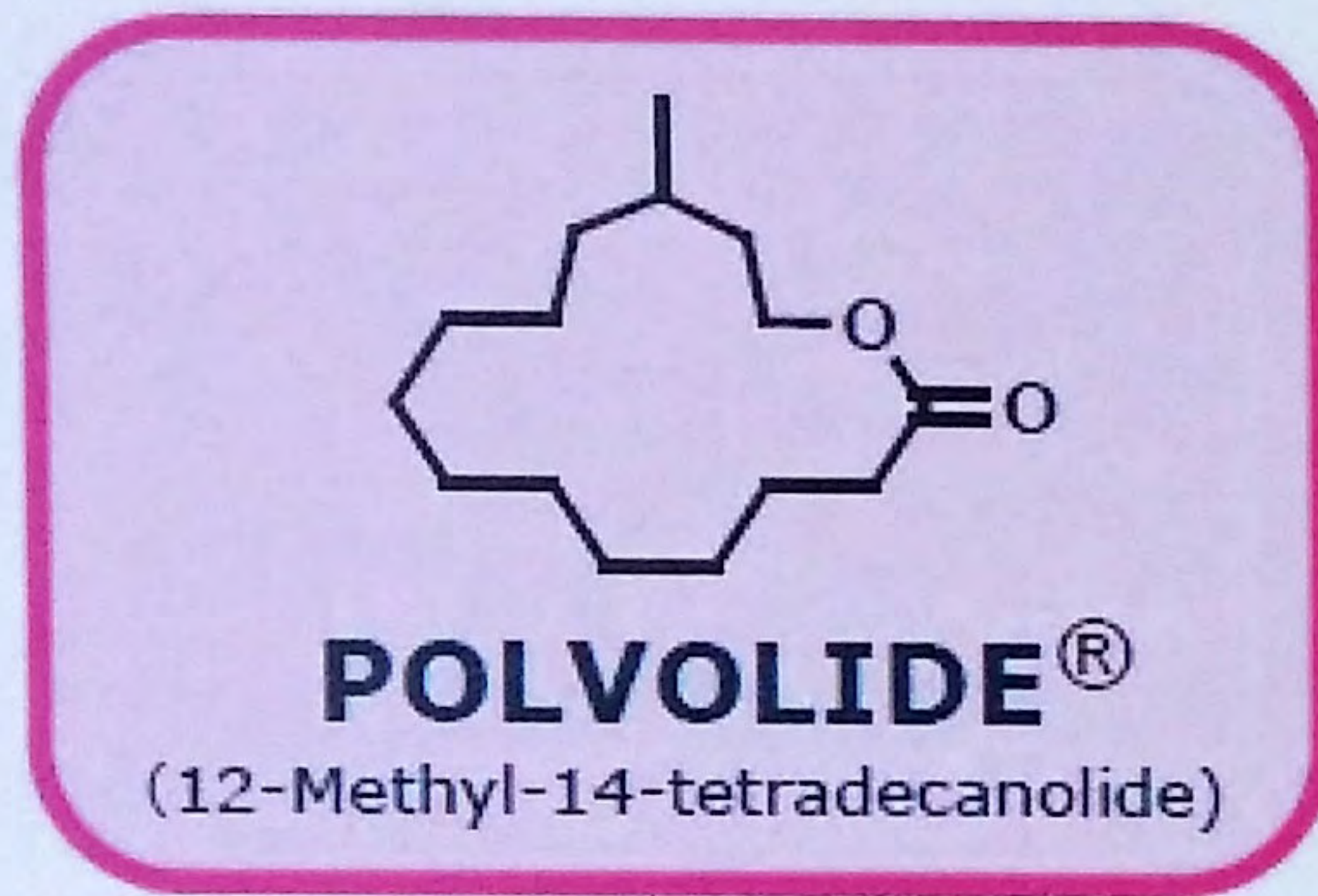
- **The evolution of powdery musks with enhanced diffusion properties**

The Soda Aromatic Co. has for a long time, starting with PENTALIDE[®], offered a wide variety of macrocyclic musks to the market. The company has completed development of a new macrocyclic musk called POLVOLIDE[®], in response to the urgent calls of perfumers who requested a variation of macrocyclic musk that had the same level of diffusible powderiness as nitro-musks and a lifting effect from the top note to the middle note.

The latest 'macrocyclic' musk

The **POLVOLIDE**® is one of our new macrocyclic musk bases

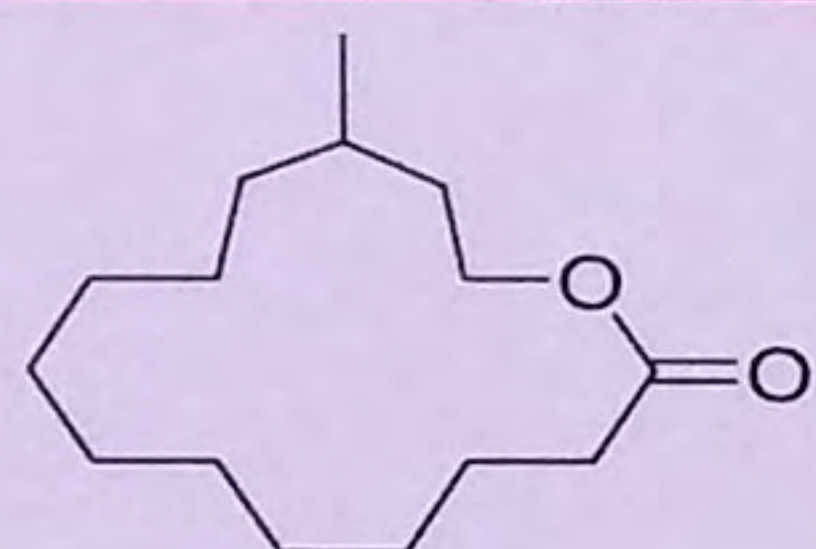
Aroma evaluation results (in-house)



		MUSKY	ANIMALIC	POWDERY	INTENSITY	INTENSITY (1 day after)
Methylated	A 13-Methyl-13-tridecanolide	●	●	•	●	●
	B 14-Methyl-14-tetradecanolide	●	●	●	●	●
	C 13-Methyl-14-tetradecanolide	●	●	●	●	●
	D 11-Methyl-13-tridecanolide	●	●	●	●	●
	E 12-Methyl-14-tetradecanolide	●	●	●	●	●
	F 13-Methyl-15-pentadecanolide	●	●	●	●	●
	G 11-Methyl-14-tetradecanolide	●	●	•	●	●
	H 12-Methyl-15-pentadecanolide	●	●	●	●	●
Unmethylated	J 13-Tridecanolide	•	•	•	●	—
	K 14-Tetradecanolide	●	●	•	●	—
	L PENTALIDE®	●	●	●	●	●
	M 16-Hexadecanolide	●	●	•	●	●
Muscone		●	●	●	●	●

MACROCYCLIC MUSK

POLVOLIDE®



POLVOLIDE®
(12-Methyl-14-tetradecanolide)

The brilliant POLVOLIDE® has boosting & luminous effect.

POLVOLIDE® diffuses really well, and gives off a powdery fragrance, but the biggest advantage of this ingredient is its booster effect. It does not just have an effect as a fragrance's base note, but also plays the role of a booster that lifts up the top and middle notes from below. This is a special feature of POLVOLIDE®, the other musks are used as base notes and Fixsative mainly.

There are also other effects that cannot be overlooked. With the effect that the company refers to as "luminous", you can experience a fragrance that is like a flower suddenly blooming. If you add POLVOLIDE® to a floral fragrance, the effect is clear. Anyone experiencing this is likely to be given the impression of a flower bud rapidly blooming, as the vivid fragrance begins to spread.

The way it interacts with the skin is also a merit of POLVOLIDE®. It is a good match for skincare beauty products, perfume, and hair care products. It has a high level of biodegradability, a powerful antibacterial effect (antibacterial for naturally occurring skin bacteria), and the powdery fragrance that Japanese people like. With its booster effect and the ability to cause fragrances to diffuse, POLVOLIDE® is truly the synthetic musk that the market has been waiting for.

MACROCYCLIC MUSK

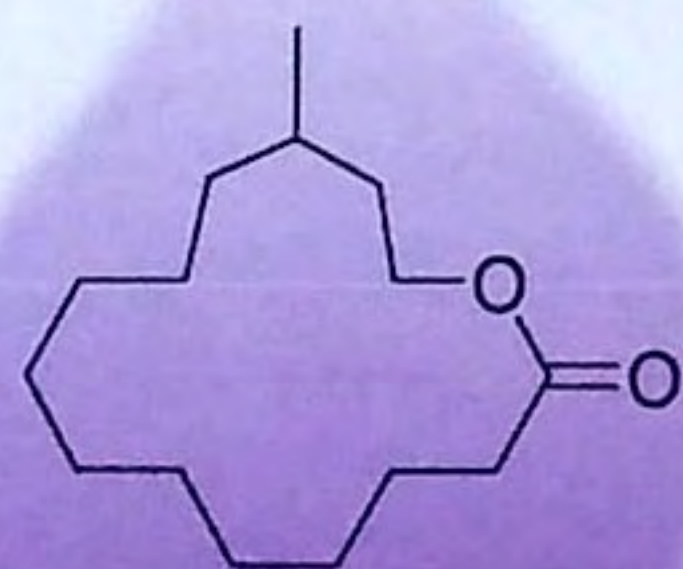
POLVOLIDE®

Odor Characteristics

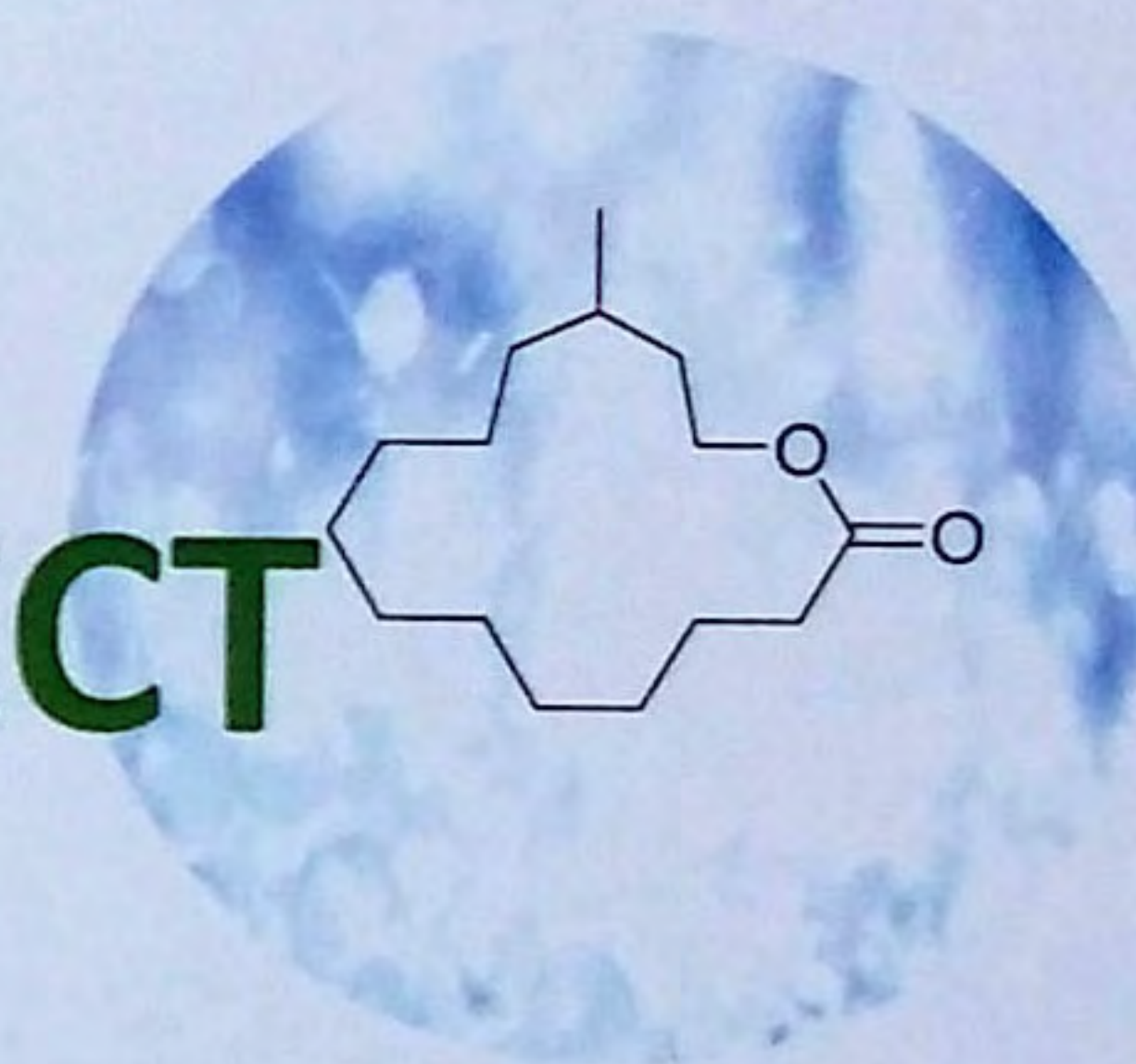
SUPER DIFFUSIVE POWDERY

Effects in Compounds

BOOSTING & LUMINOUS EFFECT

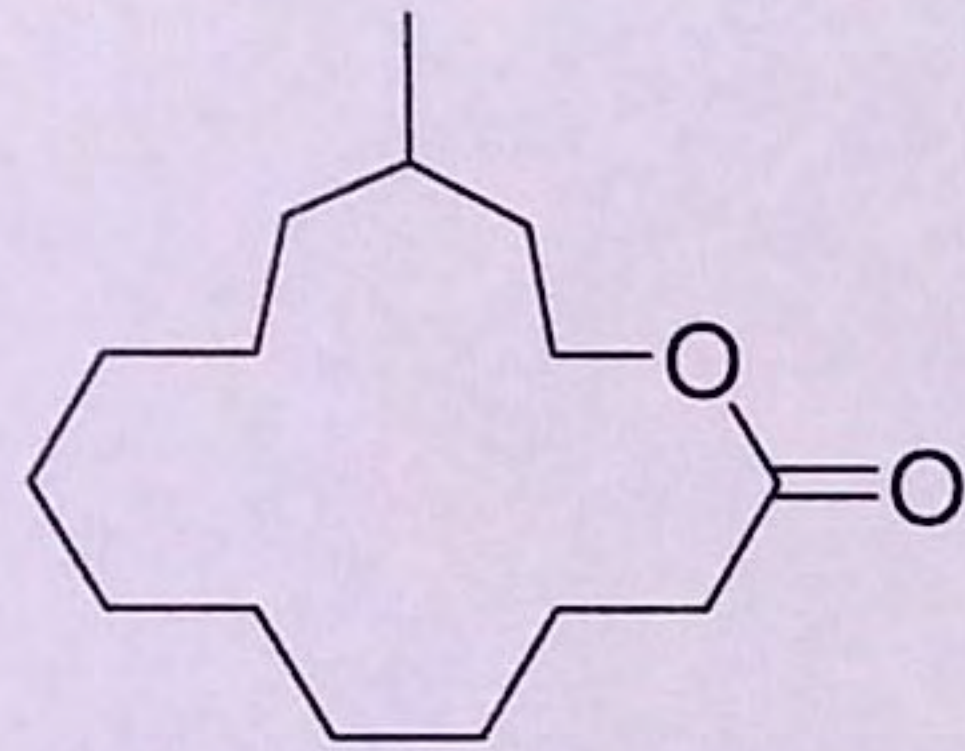


- Biodegradable, eco-friendly
- Strong antimicrobial activity



MACROCYCLIC MUSK

POLVOLIDE®



POLVOLIDE®

(12-Methyl-14-tetradecanolide)

+

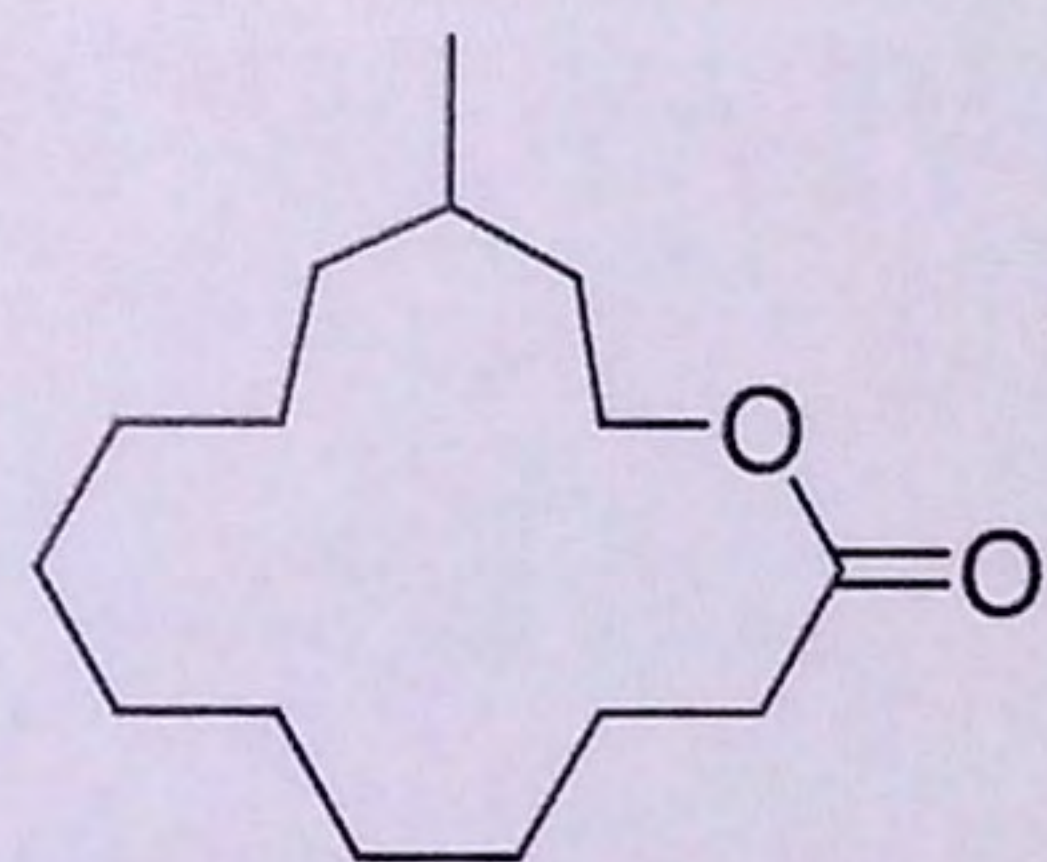
Boosting effect

Compound

Compound

MACROCYCLIC MUSK

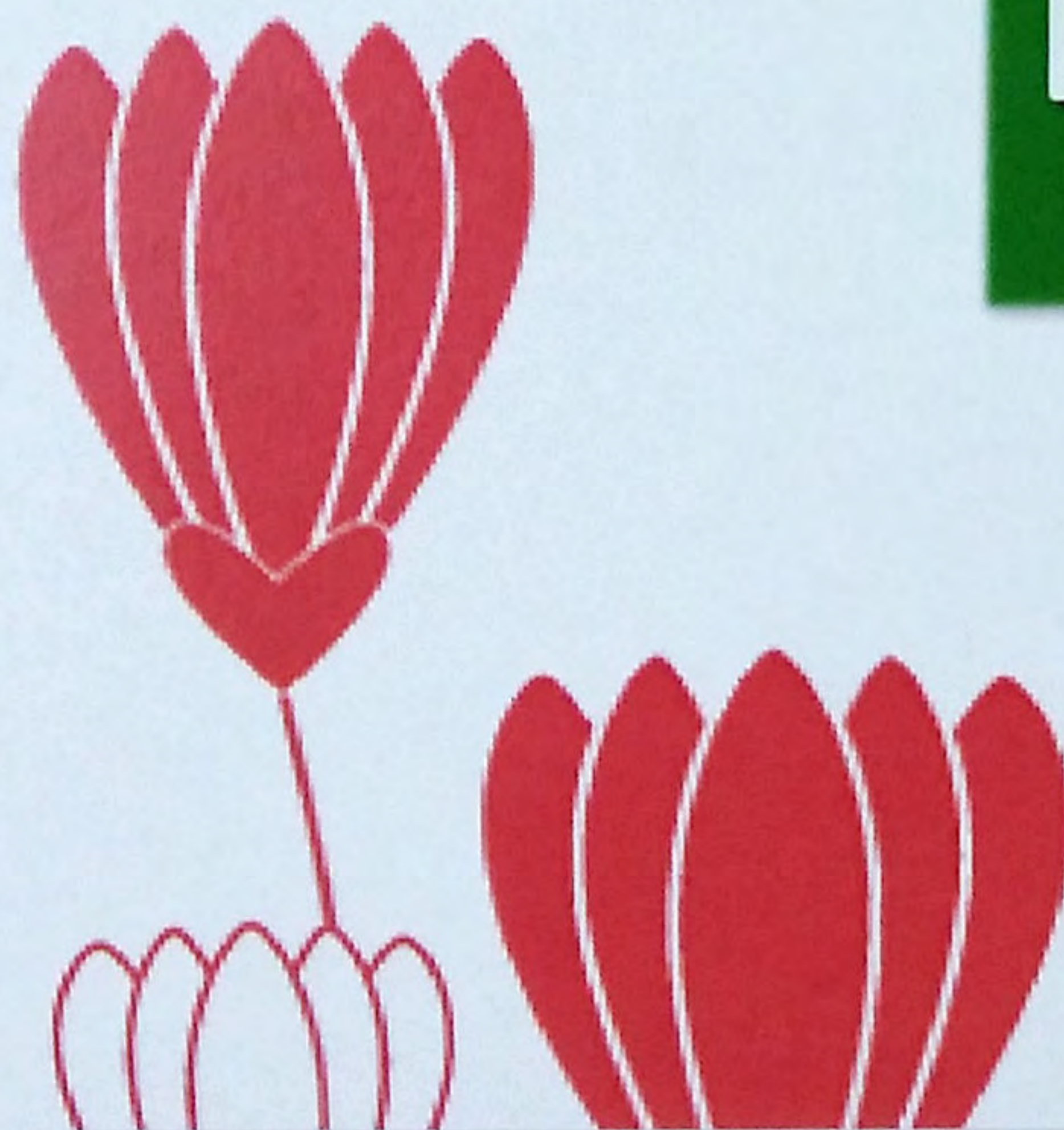
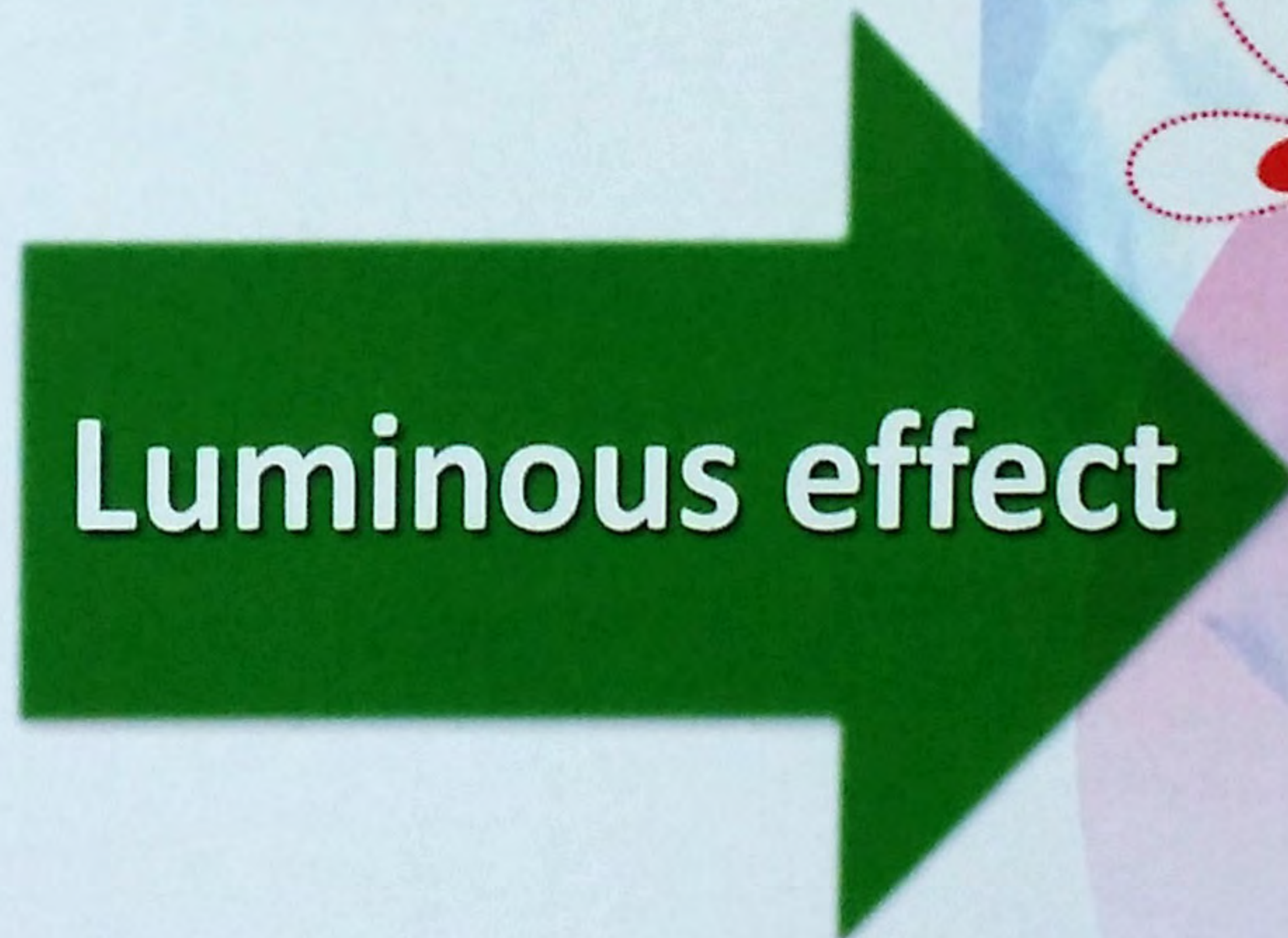
POLVOLIDE®



POLVOLIDE®

(12-Methyl-14-tetradecanolide)

+

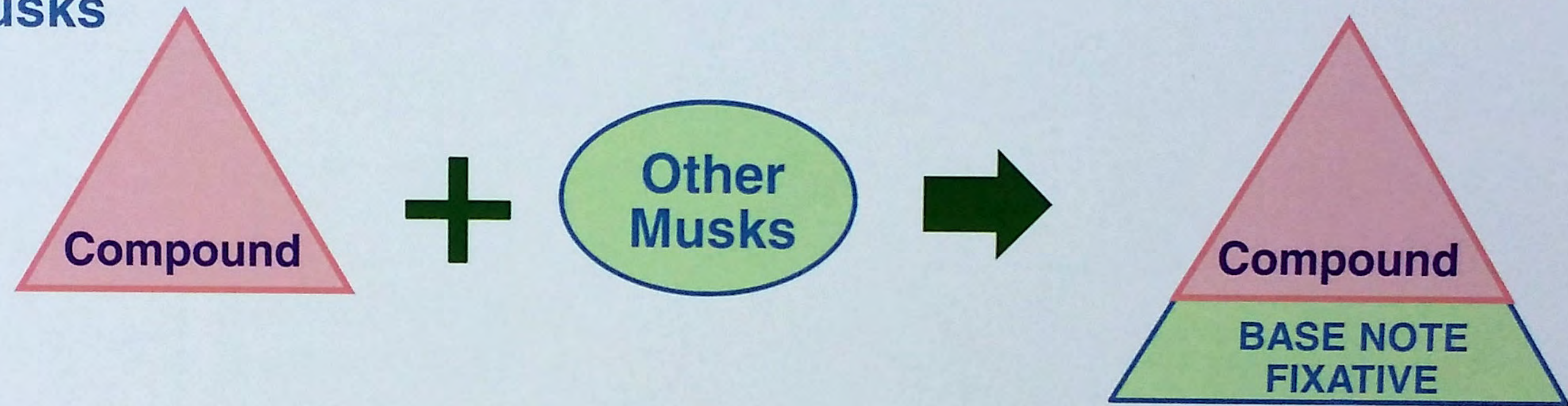


MACROCYCLIC MUSK

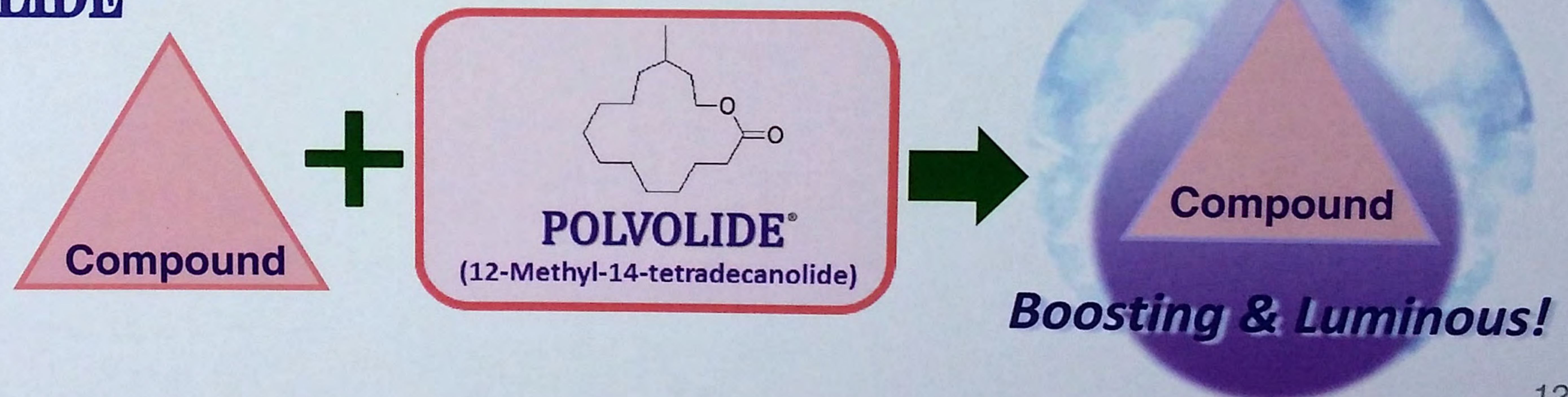
POLVOLIDE®

The brilliant **POLVOLIDE®** has Boosting & Luminous effect.

Effects of **Other Musks**
in Compounds



Effects of **POLVOLIDE®**
in Compounds



Odor Profile of Musks 1

Testing method : on blotter

MUSKY ANIMALIC POWDERY FRESH FRUITY FLORAL SWEET AMBER

	MUSKY	ANIMALIC	POWDERY	FRESH	FRUITY	FLORAL	SWEET	AMBER
POLVOLIDE[®]	Large pink circle	Large grey circle	Large white circle	Large blue circle	Large yellow circle	Large pink circle	Small dark purple circle	Large light grey circle
Musk Ambrette (NM)	Large pink circle	Medium grey circle	Large white circle	Medium blue circle	Large yellow circle	Large pink circle	Small dark purple circle	Large light grey circle
Muscenone (MCM)	Large pink circle	Large grey circle	Large white circle	Small blue circle	Small yellow circle	Small pink circle	Large dark purple circle	Small light grey circle
Galaxolide (PCM)	Medium pink circle	Small grey circle	Large white circle	Medium blue circle	Large yellow circle	Large pink circle	Large dark purple circle	Small light grey circle
Musk T (MCM)	Medium pink circle	Small grey circle	Small white circle	Small blue circle	Small yellow circle	Small pink circle	Small dark purple circle	Small light grey circle
Pentalide (MCM) <i>Exaltolide</i>	Large pink circle	Medium grey circle	Large white circle	Small blue circle	Small yellow circle	Small pink circle	Large dark purple circle	Small light grey circle
Habanolide (MCM)	Medium pink circle	Medium grey circle	Small white circle	Medium blue circle	Large yellow circle	Large pink circle	Large dark purple circle	Small light grey circle

Odor Profile of Musks 2

■ DIFFUSIVENESS

■ INTENSITY

■ INTENSITY OF 1DAY DRY OUT

Testing method : on blotter

POLVOLIDE®

Musk Ambrette

Muscenone

Galaxolide

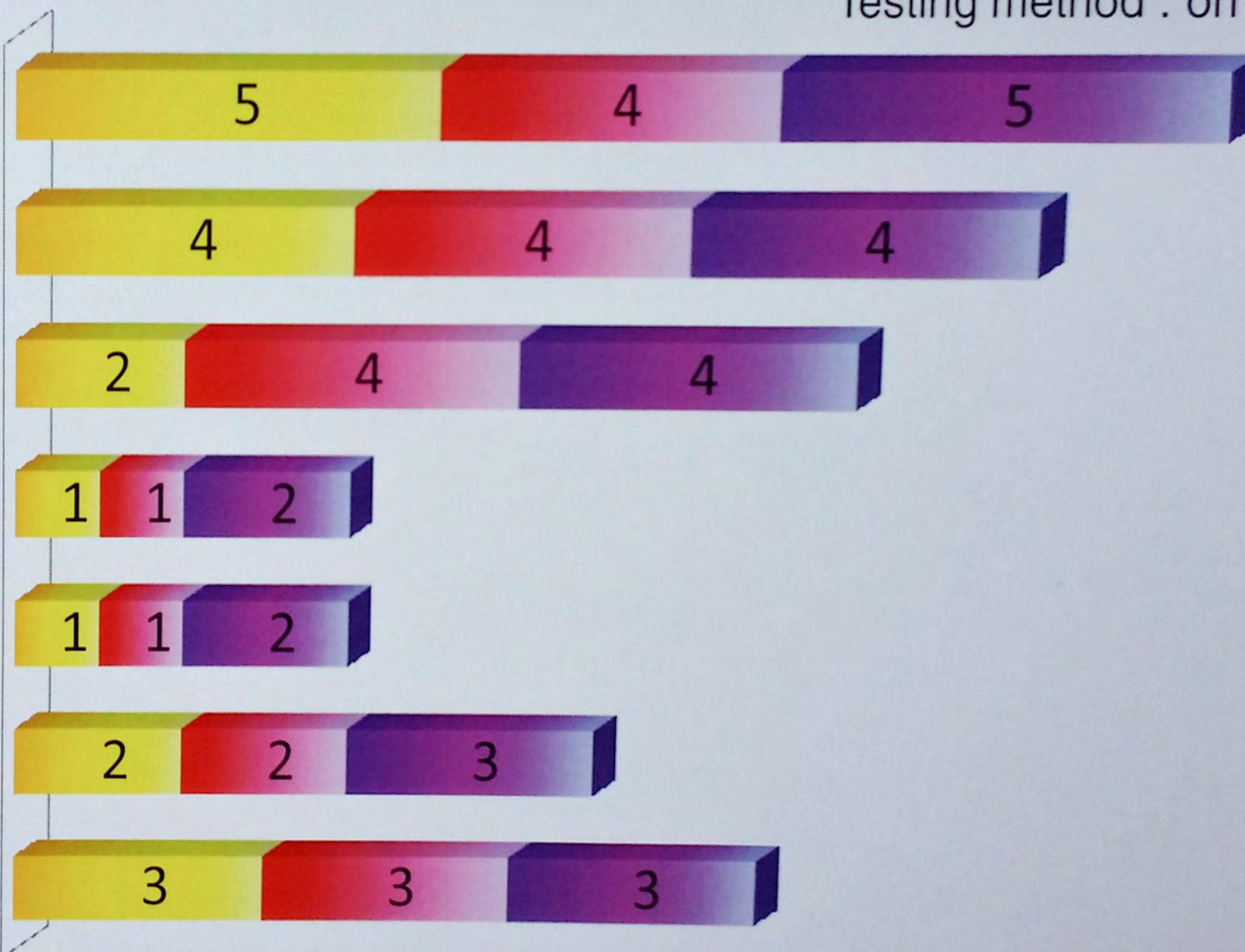
Musk T

Eth. Brass.

Pentalide

Exaltolide

Habanolide



Demonstration Formula

POLVOLIDE®

Let's move on to the demo formulas. We've prepared 4 different formulas.

1. Skin Care Cream
2. Men's Fragrance
3. Fine Fragrance
4. Cologne

DEMONSTRATION FORMULA 1. APPLICATION FOR SKIN CARE CREAM

FLORAL-POWDERY : POWDERY FLOWER AN/4901

POLVOLIDE® gives a **powdery** and sensual effect on the skin. It also **lifts the floral note**.

**BOOSTING
EFFECT**

BERGAMOT OIL	5			
LEMON OIL	20			
ORANGE OIL	5			
DIHYDRO MYRCENOL	6			
CIS-3-HEXENOL 10%	2			
TRIPLAL 10%	2			
CYCLOGALBANATE 10%	2			
CITRONELLYL ACETATE	4			
PHENYL ETHYL ALCOHOL	24			
BENZYL ACETATE	6			
METHYL DIHYDROJASMONATE	130			
FLOROL	70			
LILY ALDEHYDE	80			
CANTHOXAL	10			
ROSE OIL 10%	3			
JASMIN ABSOLUTE 10%	2			
β-IONONE	16			
γ-METHYL IONONE	36			
ISO-E SUPER	166			
CIVET BASE	2			
DPG	93			
	690			
	(W-1)	(W-2)	(W-3)	(W/O)
POWDERY FLOWER AN/4901	690	690	690	690
POLVOLIDE®	10	—	—	—
COSMONE	—	10	—	—
MUSCENONE	—	—	10	—
DPG	—	—	—	10
	700	700	700	700

DEMONSTRATION FORMULA **2. APPLICATION FOR MEN'S FRAGRANCE**

FRESH-FLORAL-SPICY-WOODY : MANIA AN/5874

POLVOLIDE[®] gives a **powdery** aspect. It also **harmonizes** the fresh **top note with the floral note.**

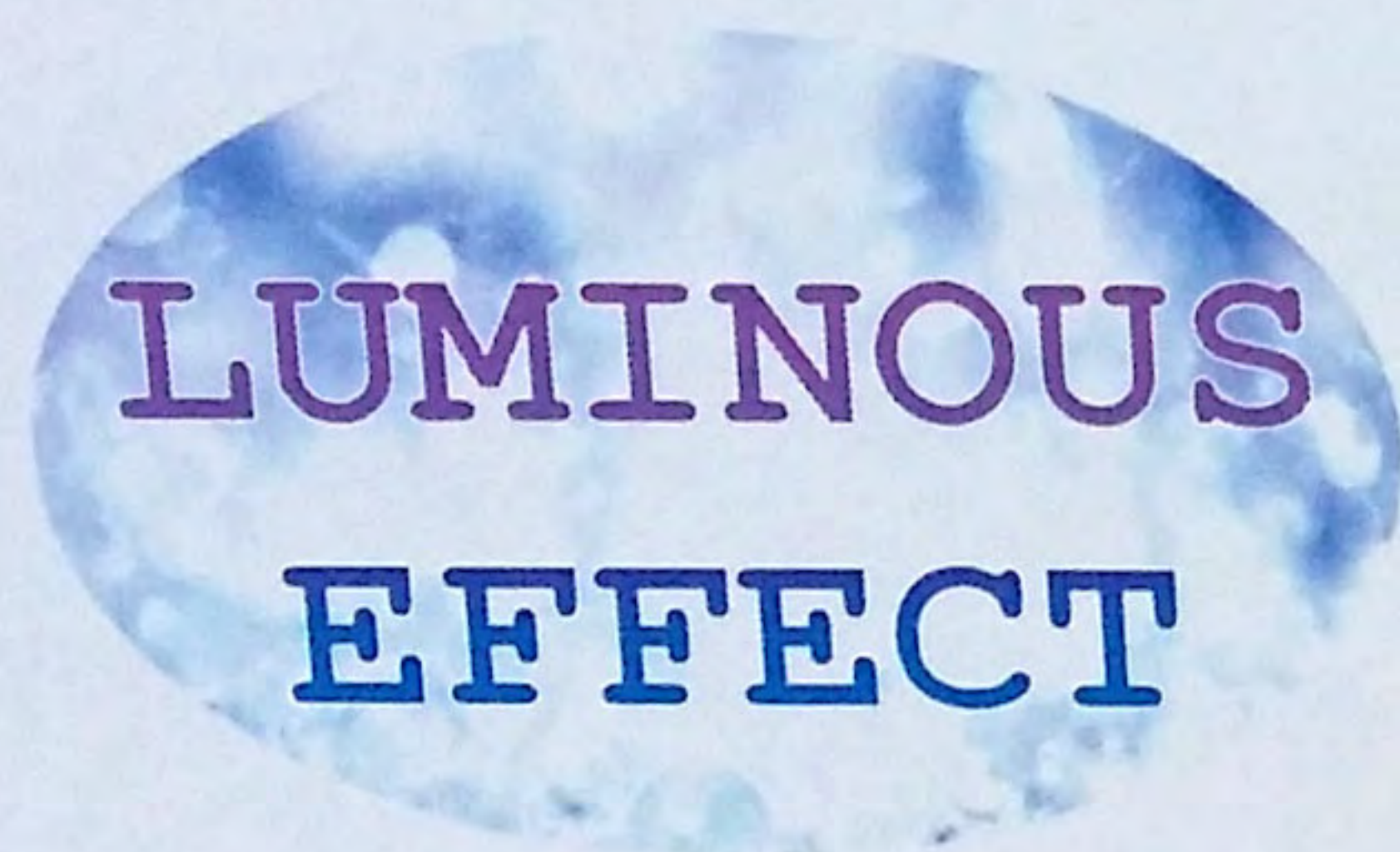
**BOOSTING
EFFECT**

BERGAMOT OIL	136	
LEMON OIL	136	282
LAVENDER OIL	10	
DIHYDROMYRCENOL	34	
NUTMEG OIL	13	51
GERANYL ACETATE	4	
ISO-AMYL SALICYLATE	25	
METHYL DIHYDROJASMONATE	50	185
FLOROL	110	
METHYL OCTIN CARBONATE	2	
EUGENOL	4	26
COUMARIN	20	
ISO-E SUPER	175	
ACETYL CEDRENE	100	282
TIMBEROL	7	
METHYL CEDRYL ETHER	14	
PATCHOULY OIL	25	54
SANDEOL	15	
DPG	80	40 Polvolide
	960	
	(W-1)	(W/O)
MANIA AN/5874	960	960
POLVOLIDE[®]	40	—
DPG	—	40
	1000	1000

DEMONSTRATION FORMULA **3. APPLICATION FOR FINE FRAGRANCE**

FLORAL BOUQUET-MUSKY : FLORAL BOUQUET KS/10538

POLVOLIDE® gives a **nitro musk**-like aspect. It also makes fragrances more **sophisticated and modern**.



BERGAMOT OIL	100
YLANG YLANG EXTRA	50
PHENYL ETHYL ALCOHOL	80
ALDEHYDE C-11 LEN 10%	25
ROSE BASE (ABS. TYPE)	20
JASMIN BASE (ABS. TYPE)	45
HEXYL CINNAMIC ALDEHYDE	80
HYDROXY CITRONELLAL	100
γ-METHYL IONONE	120
VETIVERYL ACETATE	20
EUGENOL	40
METHYL ISO-EUGENOL	20
BENZYL SALICYLATE	200
DPG	50
	950

	(W-1)	(W-2)	(W-3)	(W/O)
FLORAL BOUQUET KS/10538	950	950	950	950
POLVOLIDE®	—	5	50	—
(PENTALIDE <i>Exaltolide</i>)	50	45	—	—
DPG	—	—	—	50
	1000	1000	1000	1000

DEMONSTRATION FORMULA **4. APPLICATION FOR COLOGNE**

FRESH-FLORAL-AMBER : GREEN BREEZE MT/7396

POLVOLIDE[®] gives a **powdery** aspect. It also **harmonizes** the fresh top note with the floral note.

LIME OIL	20
BERGAMOT OIL	100
MANDARIN OIL	25
SWEETIE OIL	10
LEMON OIL	10
CITRAL	6
TAMARIN BASE	10
ALDEHYDE C-10 10%	8
TRIPLAL	5
CIS-3-HEXENYL ACETATE 10%	2
ALLYL IONONE	2
LINALYL ACETATE	40
GERANIOL	20
PHENYL ETHYL ACETATE	5
DAMASCENONE 10%	8
ROSE ABSOLUTE	3
PEOMOSA	50
METHYL DIHYDROJASMONATE	340
HEXYL CINNAMIC ALDEHYDE	100
CASSIS BASE	1
DIMETHYL BENZYL CARBINYL BUTYRATE	2
γ-UNDECALACTONE C-11 10%	5
LAUREL OIL	5
THYME OIL	3
CLARY SAGE OIL	30
β-IONONE	10
ISO-E SUPER	45
PATCHOULY OIL 10%	3
EVERNYL	1
AMBROXAN	8
DPG	73
	950

	(W-1)	(W-2)
GREEN BREEZE MT/7396	950	950
POLVOLIDE[®]	—	5
(PENTALIDE) <i>Exaltolide</i>	50	45
	1000	1000



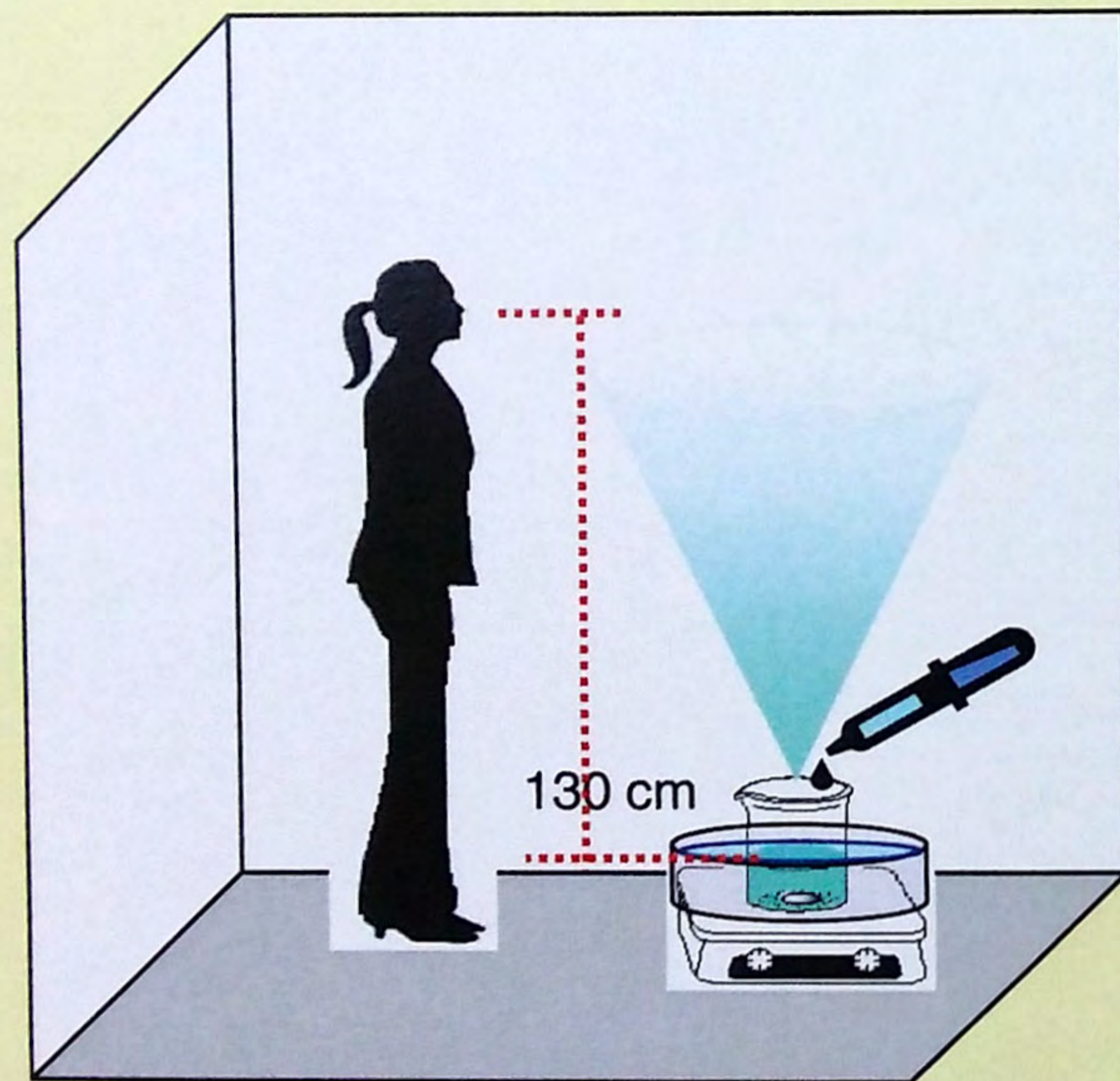
Attached documents

- **Diffusiveness test results**
- **Biodegradability test results**
- **Antimicrobial test results**

Diffusiveness Test

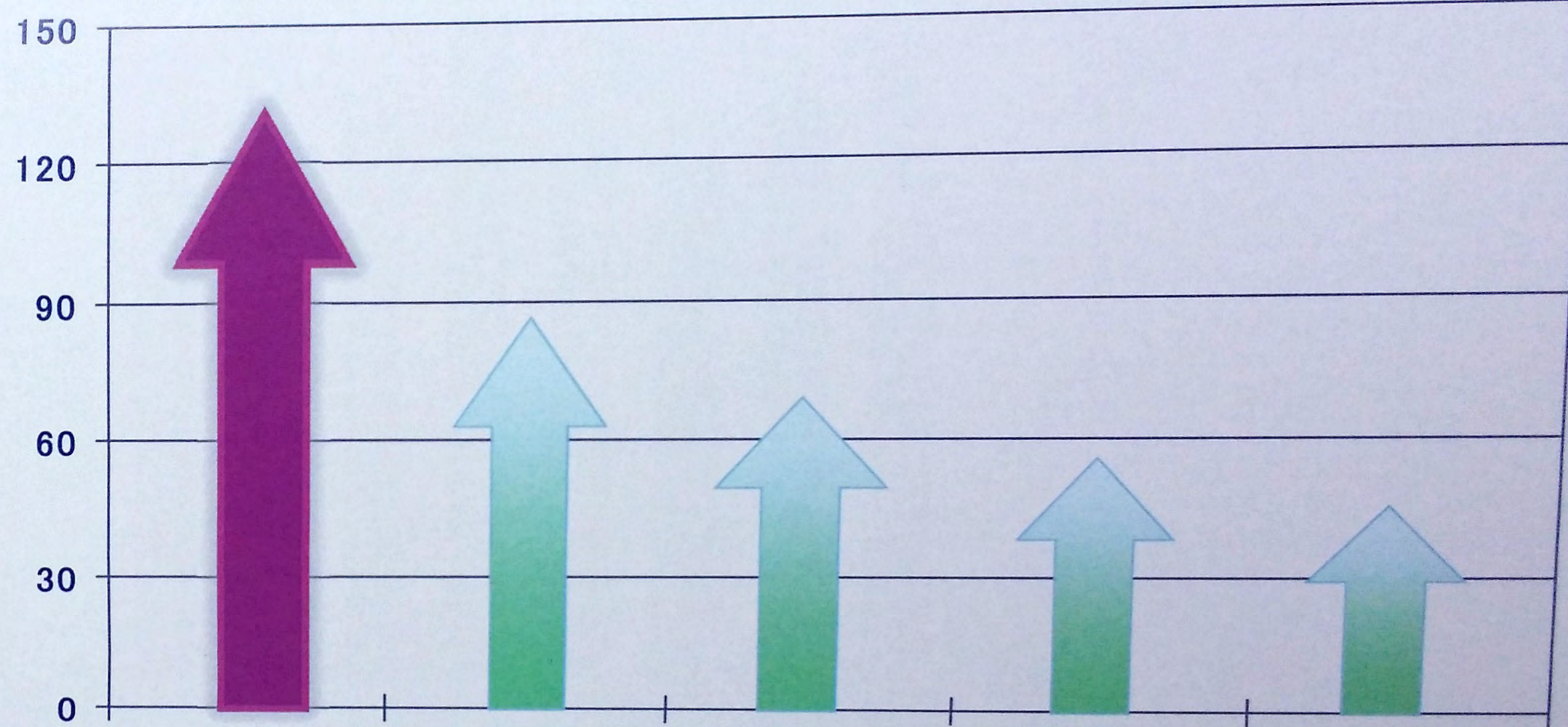
Testing method ;

Each musk is dropped into the water at 37°C as 0.1% solution .
The speed to reach the height of 130 cm was measured.



SUPER DIFFUSIVE

Diffusiveness speed [mm / s]



POLVOLIDE®

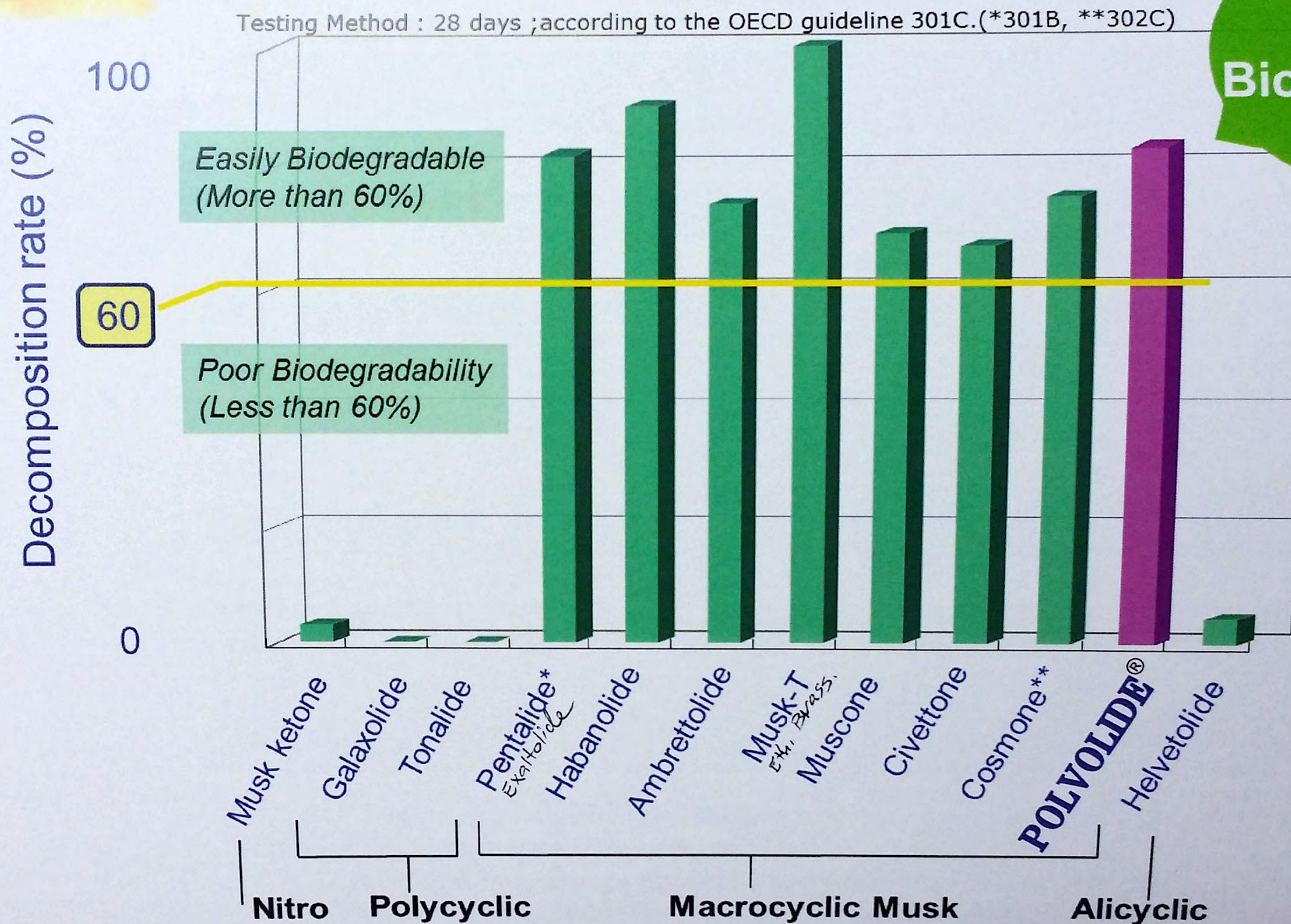
Habanolide

Muscenone

Galaxolide

Musk-T
E.H. Brass

Biodegradability Test



Easily Biodegradable

Antimicrobial Test

Strong
Antimicrobial
Activity

	A <i>Staphylococcus aureus</i>	B <i>Corynebacterium xerosis</i>	C <i>Propionibacterium acnes</i>	D <i>Staphylococcus Epidermidis</i>
POLVOLIDE®	S	S	S	W
Pentalide <i>Exaltolide</i>	S	S	S	W
Habanolide	S	S	S	M
Cosmone	M	S	M	W
Muscenone	M	S	S	M
Musk-T <i>Eth. Brass.</i>	W	W	M	W
Ambrettolide	M	M	S	W
Musk ketone	W	W	W	W
Galaxolide	M	S	M	W
Helvetolide	M	S	S	W
Farnesol	S	M	M	S
Hinokitiol	W	S	S	W
Isopropylmethyphenol	W	W	M	W

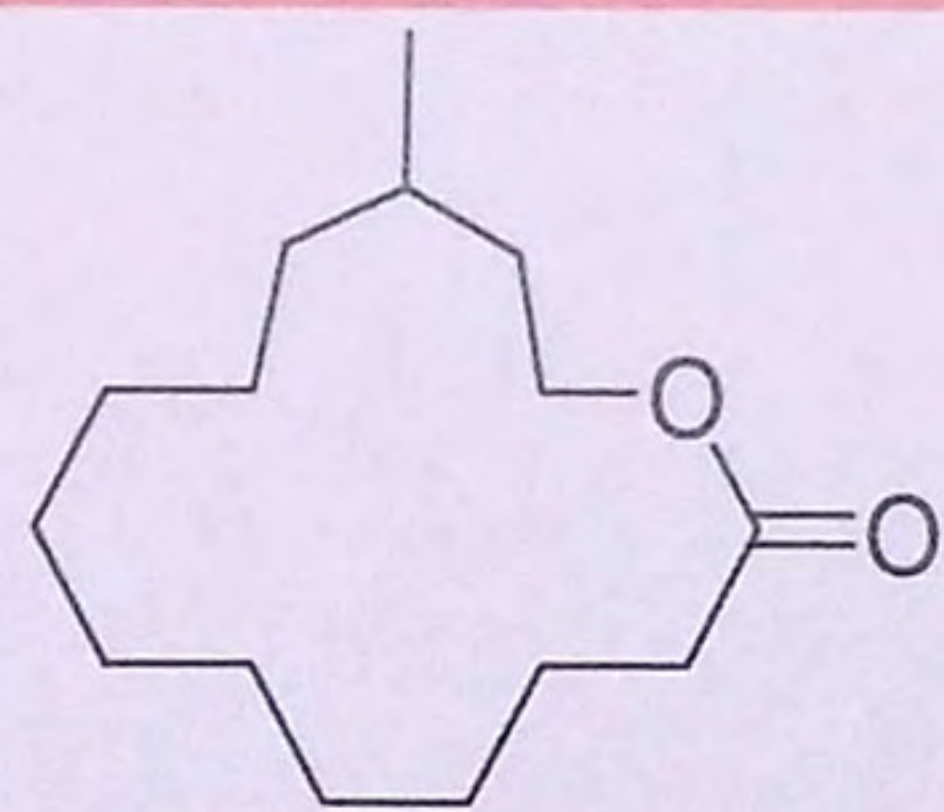
- A) Bad bacteria that causes an infection and decomposed odor.
 B) Bad bacteria that causes body odor.
 C) Bad bacteria that causes acne by large amount of its occurrence.
 D) Good bacteria that helps to maintain the health of skin.

S : Strong
M : Moderate
W : Weak

Testing Method : 10 ppm in cultures

MACROCYCLIC MUSK

POLVOLIDE®



POLVOLIDE®

(12-Methyl-14-tetradecanolide)

- Unique odor characteristics:
SUPER DIFFUSIVE & POWDERY
- Impressive effects in compounds:
BOOSTING & LUMINOUS effects
- Biodegradable, eco-friendly
- Strong antimicrobial activity