

Vitamin A

*Revealing the Power
of Vitamins for Beauty Care*

August 2023

Agenda

- 1 Vitamin A in Skincare
- 2 DSM in the Vitamin A Journey
- 3 Consumers & Customers Insights
- 4 Scientific Evidence on Retinol
- 5 Comparison Among Different Forms of Vitamin A
- 6 Formulation Tips



Click on the number to get redirected to the chapter



Vitamin A in skincare



Retinol (Vitamin A)

The all-time anti-aging hero

PROVEN BENEFITS

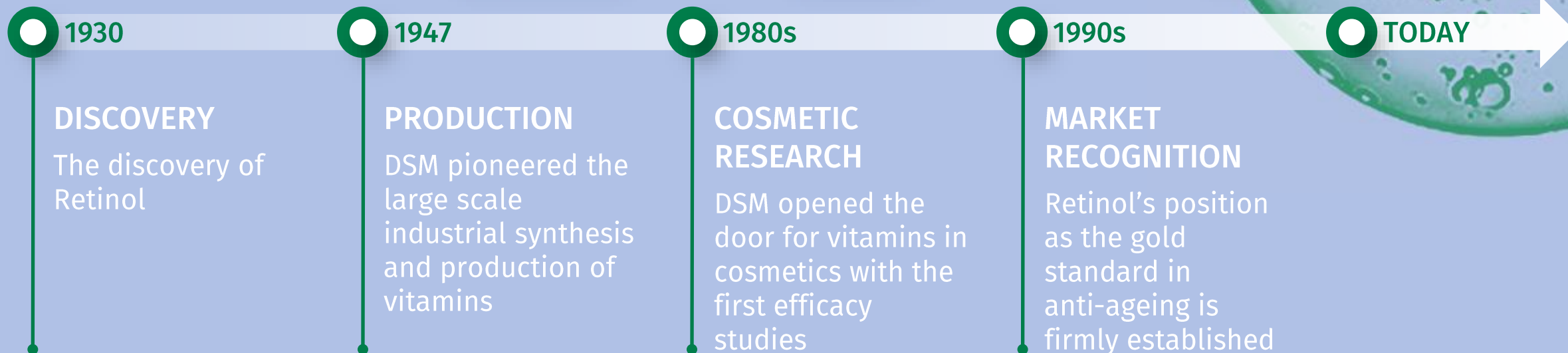
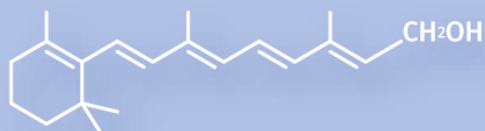
- ✓ Reduces skin photo-damage effects
- ✓ Improves the appearance of fine lines & wrinkles
- ✓ Improves skin firmness & elasticity
- ✓ Improves skin smoothness
- ✓ Decreases skin roughness
- ✓ Reduces skin discoloration & mottled pigmentation
- ✓ Rebalances uneven skin tone



DSM in the Vitamin A journey



Proud to be part of the remarkable journey of Retinol in cosmetics



Cosmetic grades of Quali-A®

Product	Technical details	Size	Product Code	
Retinol CB 50	- Stabilized with natural Tocopherols - Based on naturally derived alkanes 428–495 mg Retinol equivalents/g	1 kg	5017297.264	- Vitamin A alcohol – In its purest form 50% blend of retinol and alkanes
		5 kg	5017297.294	
Retinol GS 50	- Stabilized with BHT and BHA - Based on Polysorbate 20 428–495 mg Retinol Equivalents/g	1kg	50 15117.264	- Vitamin A alcohol – In its purest form 50% blend of retinol and polysorbate 20
		5 kg	50 15117.294	
Vitamin A Acetate 1.5 MIU/g	- Stabilized with tocopherol - Based on peanut oil 450 mg Retinol Equivalents/g	5 kg	04 18846.294	- Vitamin A acetate, adjusted to 1.5 MIU/g by adding peanut oil. - Contains dl-α-tocopherol as an antioxidant



Quali-A®

Cosmetic grades of Quali-A®

Product	Technical details	Size	Product Code	
Vitamin A Palmitate 1.7 MIU/g	- Stabilized with tocopherol 510 mg Retinol Equivalents/g	5 kg 20 kg 190 kg	04 18579.294 04 18579.336 04 18579.422	- Pure vitamin A palmitate - Contains dl-α-tocopherol as an antioxidant
Vitamin A Palmitate 1.7 MIU/g	- Without stabilizers 510 mg Retinol Equivalents/g	5 kg 20 kg 190 kg	04 24005.294 04 24005.336 04 24005.420	Pure vitamin A palmitate, no formulation aid
Vitamin A Palmitate 1.7 MIU/g	- Stabilized with BHA/BHT 510 mg Retinol Equivalents/g	5 kg 20 kg	04 24013.294 04 24013.336	Pure vitamin A palmitate
Vitamin A Palmitate 1.0 MIU/g	- Stabilized with tocopherol - Based on peanut oil 300 mg Retinol Equivalents/g	5 kg	04 31400.294	- Vitamin A palmitate, adjusted to 1.0 MIU/g by adding peanut oil - Contains dl-α-tocopherol as an antioxidant
Vitamin A Palmitate/M 1.0 MIU/g	- Stabilized with tocopherol - Based on medium chain triglycerides 300 mg Retinol Equivalents/g	5 kg	50 08530.294	- Vitamin A palmitate, adjusted to 1.0 MIU/g by medium chain triglycerides (INCI: caprylic/Capric Triglyceride) - Contains dl-α-tocopherol as an antioxidant
Vitamin A Palmitate 1.0 MIU/g	- Stabilized with BHA/BHT - Based on peanut oil 300 mg Retinol Equivalents/g	5 kg	04 20603.294	Vitamin A palmitate, adjusted to 1.0 MIU/g by adding peanut oil



Quali-A®

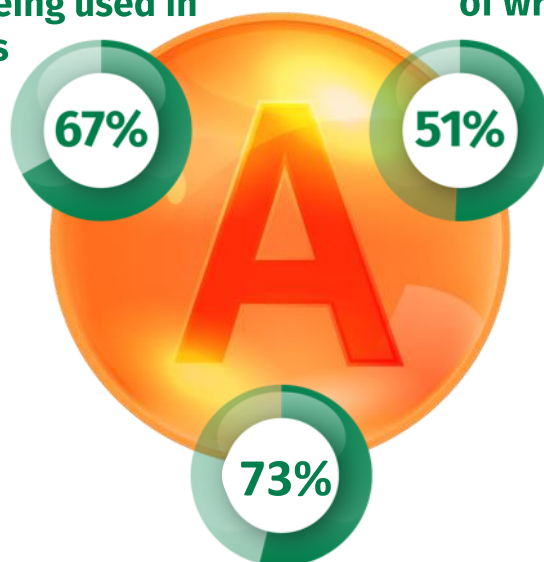
Consumers' insights



A good case of ingredient recognition

High awareness & credibility

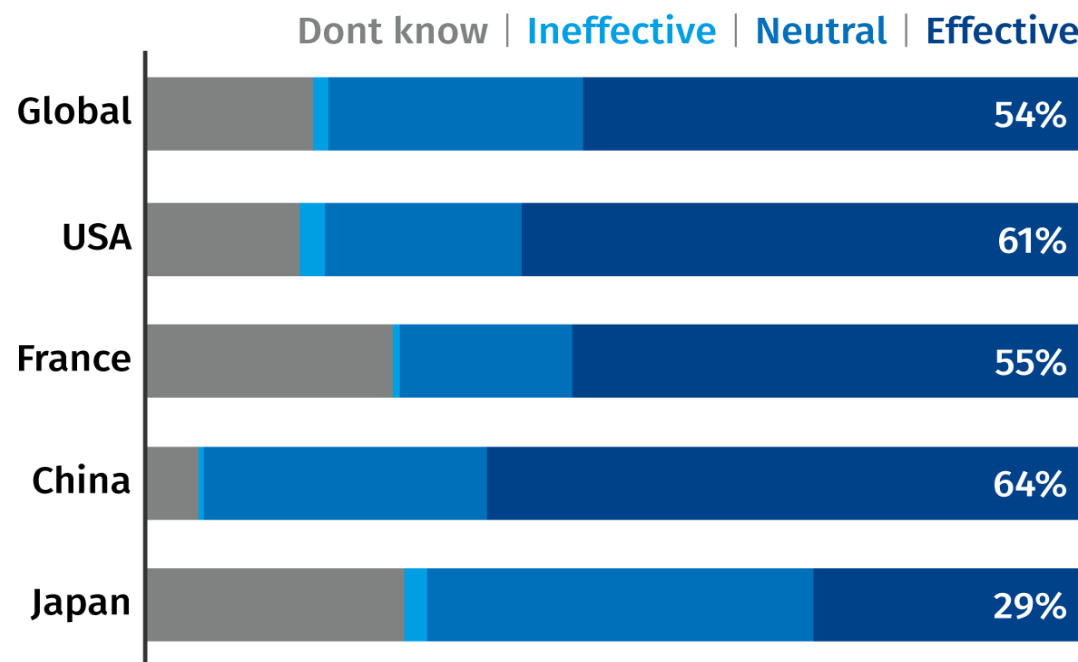
In the US and France,
67% of women are
aware of Vitamin A/
**Retinol being used in
cosmetics**



Of US women
link it to **anti-
aging/ removal
of wrinkles**

Of women aware of it as an ingredient sees it
to be **effective in cosmetics**

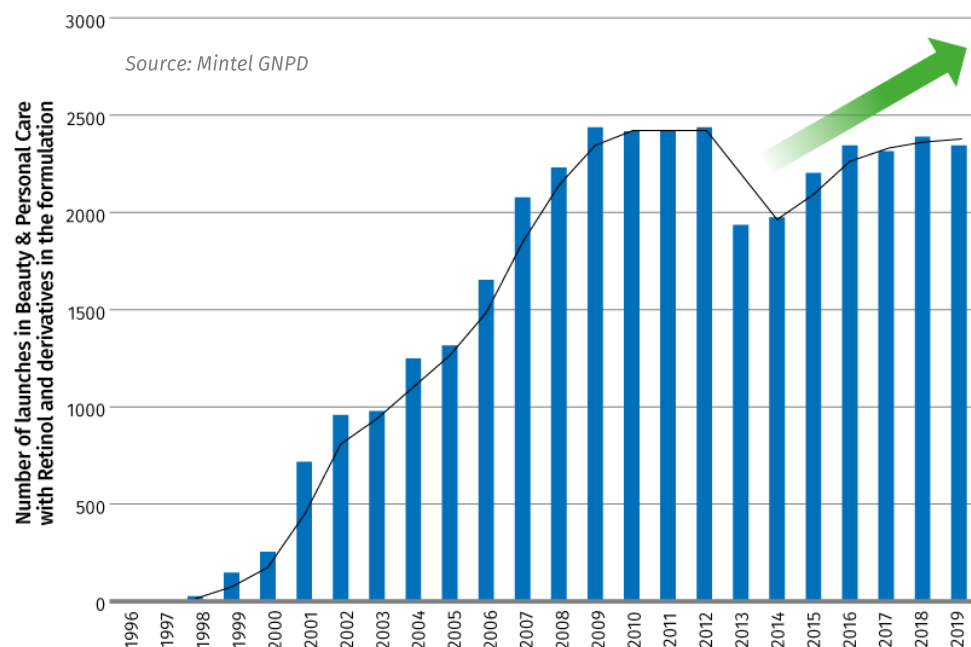
Q. How effective do you think Retinol is in
cosmetic products?



DSM PCA Vits study, Jan 2016. Global- N=1171, USA- N=323, France- N=260, China- N=342, Japan- N=246- All females

B2C companies leverage Retinol to drive innovation & sales

- **~40k** Beauty & personal Care products **feat. Retinol** (and/or derivatives) have been launched in in last 20yrs (mostly facial)
- Retinol back on trend in last 5Yrs: **+20% avg NPIs/year vs 2013**



2019 WINNER

CEW COSMETIC EXECUTIVE WOMEN



BEST SELLER

SEPHORA



BEST SELLER

amazon



RECORD ON-LINE
2020 PRE-SALE

100k
consumers
on waiting list
at launch



AUTUMN 2020
INNOVATION



Retinol

Scientific evidence

Learn more...



Request a sample



Retinol Efficacy



WRINKLES REDUCTION

Consumer Benefits

- Reduces appearance of fine lines & wrinkles
- Improves skin firmness & elasticity

Molecular & Gene Level

- Increases synthesis of Collagen & Elastin
- Inhibits MMPs, reducing Collagen & Elastin degradation

Structural & Functional Level

- Improves organization of Collagen and Elastin fibres in papillary dermis
- Improves structure of Dermal-Epidermal Junction (DEJ)



EPIDERMAL THICKENING

Consumer Benefits

- Improves skin smoothness
- Decreases skin roughness

Molecular & Gene Level

- Stimulates Ki-67 expression
- Increases deposition of Glycosaminoglycan in the epidermis

Structural & Functional Level

- Increases epidermal proliferation
- Thickens the epidermis
- Compacts the stratum corneum



EVEN SKIN TONE

Consumer Benefits

- Reduces discoloration, mottled pigmentation
- Rebalances uneven tone

Molecular & Gene Level

- Downregulates Tyrosinase activity
- Decreases Melanin content

Structural & Functional Level

- Inhibits Melanosome transfer

New DSM *In vivo* Study

STUDY SET-UP

One target group

- 50-65 y.o.

25 Volunteers per formulation

- Placebo
- Retinol GS50 0.2%

Application: 4 weeks,
2x per day, full face

Randomized single centre Study
Double blind



New
Clinical
Study

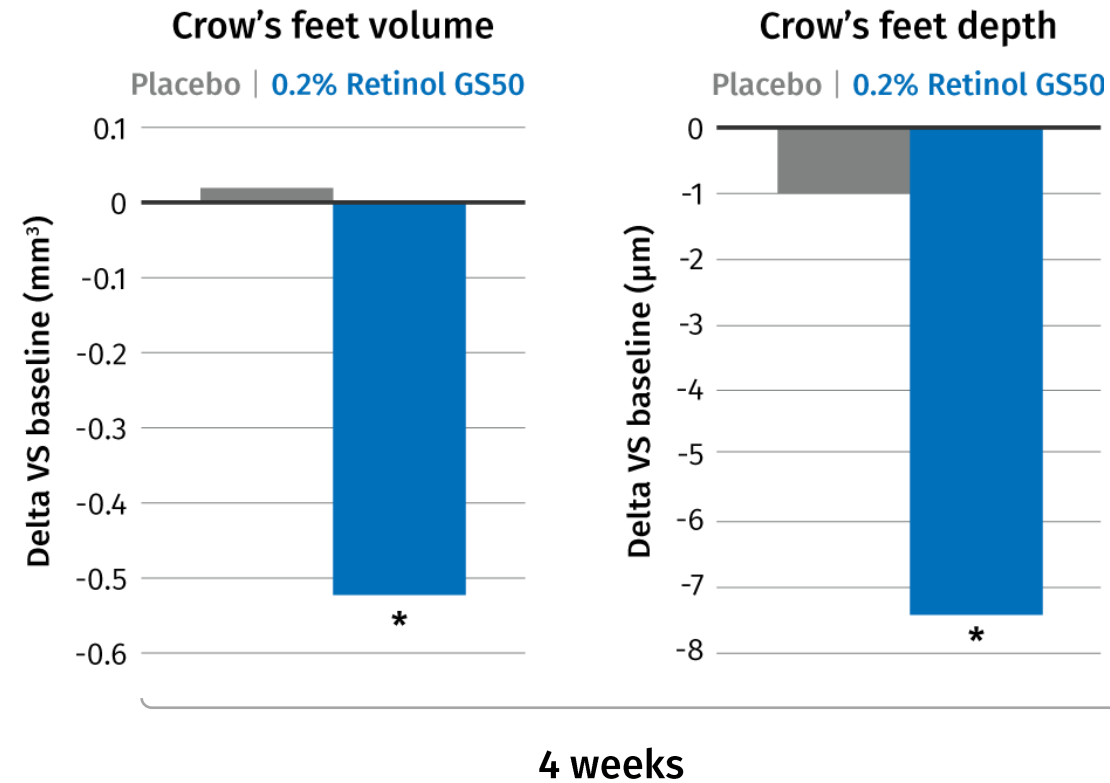
NEW

Retinol* proven to reduce crow's feet wrinkles in just 4 weeks

Visible effect and quantification by Primos^{lite} measurement



In 4 weeks only



Significant ($p < 0.05$) improvement on crow's feet parameters (less volume and depth)

In the same time placebo effect was negligible

With prolonged retinol application a continuous improvement over time is expected

* RETINOL GS 50, same efficacy with RETINOL CB 50

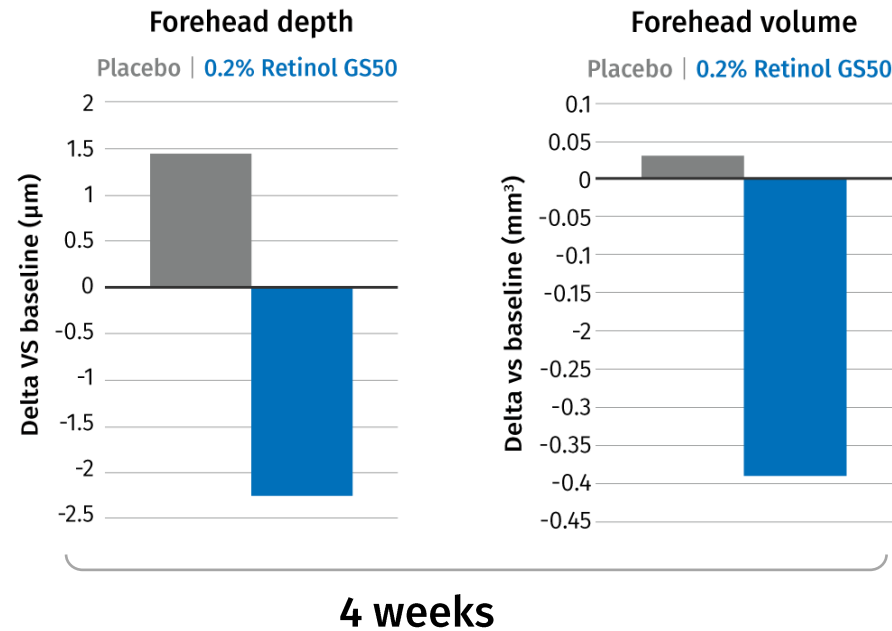
NEW

Retinol* proven to reduce forehead wrinkles in just 4 weeks

Primos^{lite} measurement



In 4 weeks only



DSM Nutritional Products
own study

Strong trend for improvement on forehead wrinkles (less volume and depth)

In the same time placebo was ineffective with slight aggravation

With prolonged retinol application a continuous improvement over time is expected

* RETINOL GS 50, same efficacy with RETINOL CB 50

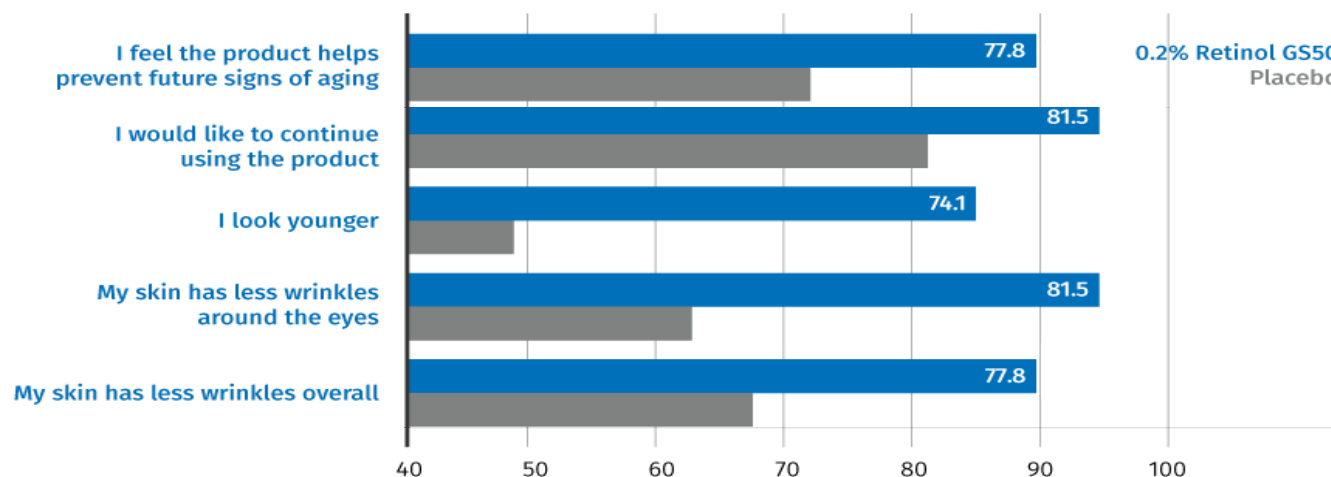
Volunteers' self-assessment

Amazing feedback for Retinol!*



WRINKLES REDUCTION

Qualitative questionnaire



DSM Nutritional Products
own study

* RETINOL GS 50, same efficacy with RETINOL CB 50



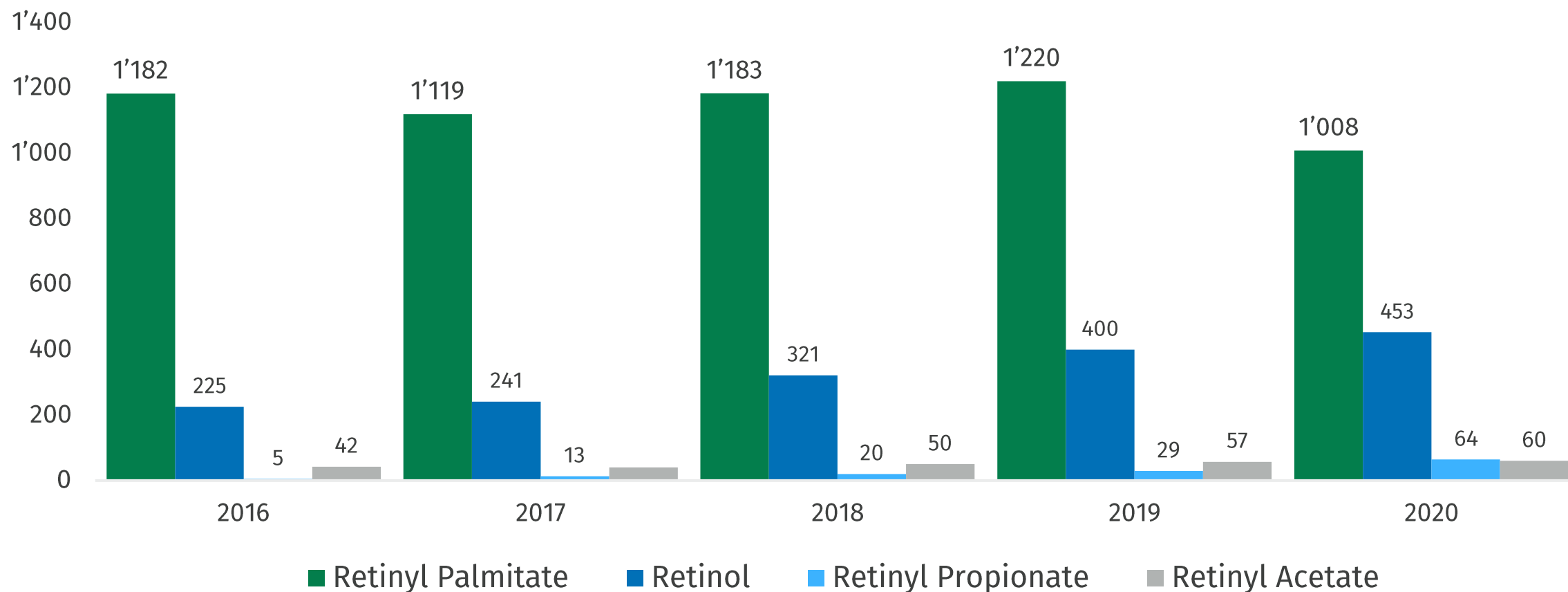
Comparison among Different Forms of Vitamin A



Vitamin A launches around the globe

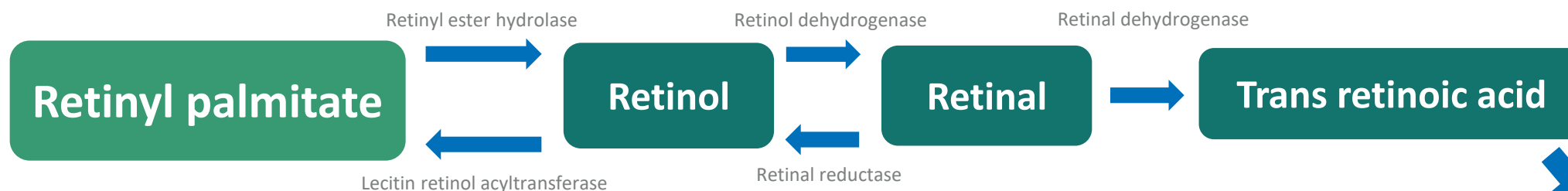
DSM offers the 3 key forms

Vitamin A: Total Global Launches in Skin Care



Retinyl Palmitate

Just one step away from retinol



Retinyl palmitate (RP) is more stable than retinol, but needs to be used in higher concentration

RP is converted to retinol and subsequently to the active form in skin

Increased use level of RP compensates for the extra conversion step compared to retinol

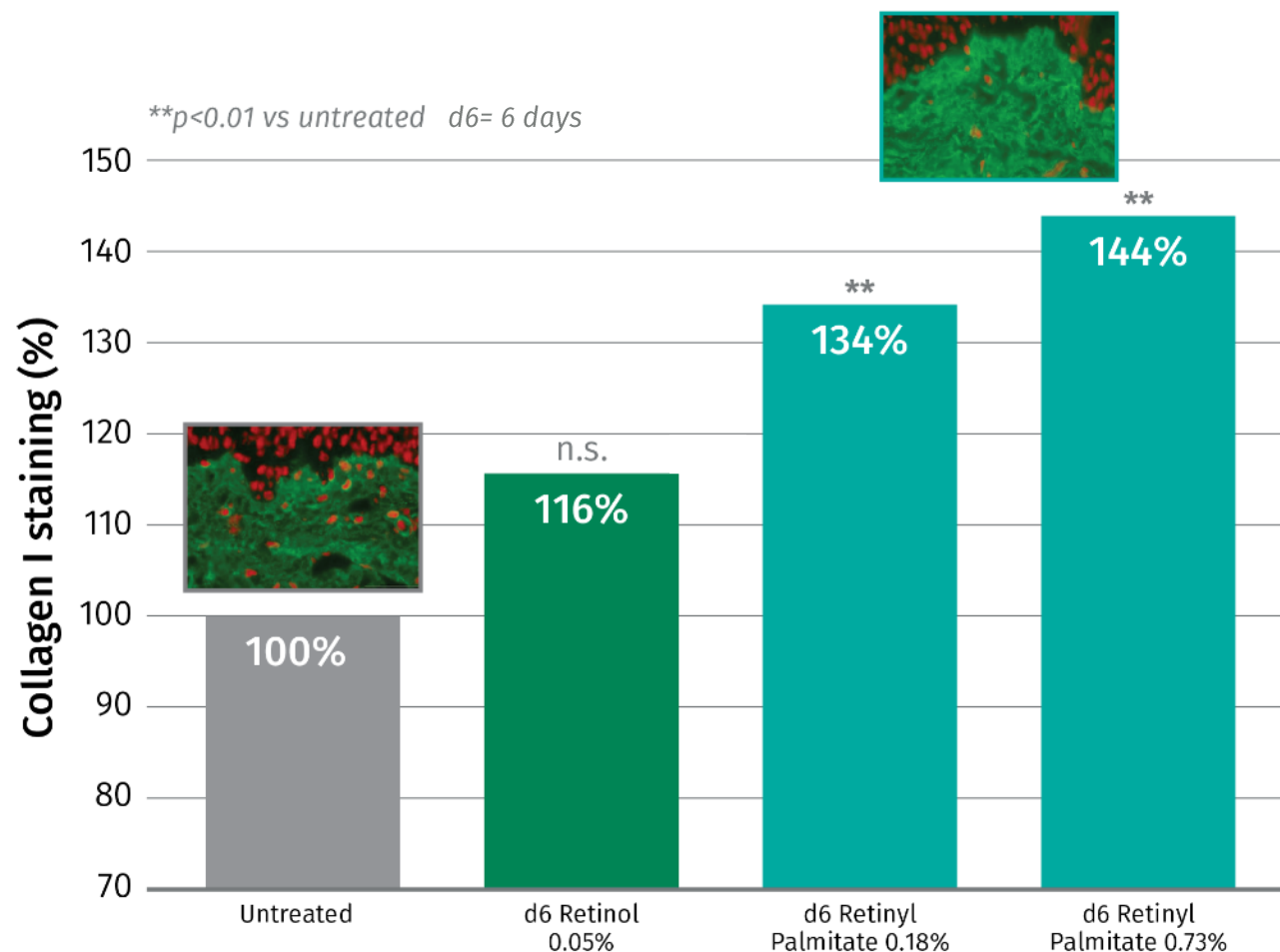
RP is naturally present in skin as storage form of retinol



anti aging effects

Retinol and derivative- Collagen I

6 days of ex vivo skin treatment



Collagen I staining was quantified in the papillary dermis using cellSens software

DSM Nutritional Products
own study

NEW

Retinol 0.05% boosts collagen I by **16%**

Retinyl Palmitate, significantly boosts collagen I, but at higher concentration than Retinol – and dose dependently

- **34%** collagen I boost at 0.18%
- **44%** collagen I boost at 0.73%

	Retinol equivalent
0.05% Retinol= 0.1% Retinol CB50	1x
0.18% Retinyl Palmitate	2x
0.73% Retinyl Palmitate	8x

Collagen I is the most abundant collagen in the dermis but more difficult to boost

Retinol Booster

Line-up- The perfect Match

- **Retinol** *reduces* the appearance of lines and *wrinkles* while *improving firmness* and *elasticity* of the skin.
- **BEAUACTIVE®** high purity and *sustainable* patent ingredient that activates the master cell regulators, *boosting collagen* production.
- **MatchUp**
Advanced dual technology that combines a *magnificent* oil gel with *Retinol* and a smooth cream with **BEAUACTIVE®** to synergistically *boost collagen* and deliver an effective and *visible anti- wrinkle* results.



Formulation tips



Formulation Tips

RETINOL CB 50*

- RETINOL CB 50 *is soluble* in fats and oils
- **Sensitive to Oxygen.** It is therefore recommended to manufacture retinol formulations under an inert atmosphere or to reduce the presence of Oxygen during handling and production to the possible minimum.
- **Sensitive** to higher **temperatures** (> 40°C) and daylight.
- To improve the **stability** of RETINOL CB 50 in the formulation it is recommended to add **chelating agents** like EDTA, **UV absorbers** like PARSOL® Guard* and antioxidants like **Mixed Tocopherols** or STAY-C® 50.
- **STAY-C® 50** has recently shown **high performance to recover retinol content** at room temperature and 40 °C. Be aware, that it is a salt and may impact the stability of electrolytes sensitive systems.
- Recommended **pH** of the final formulation: **4.5 – 8.0**

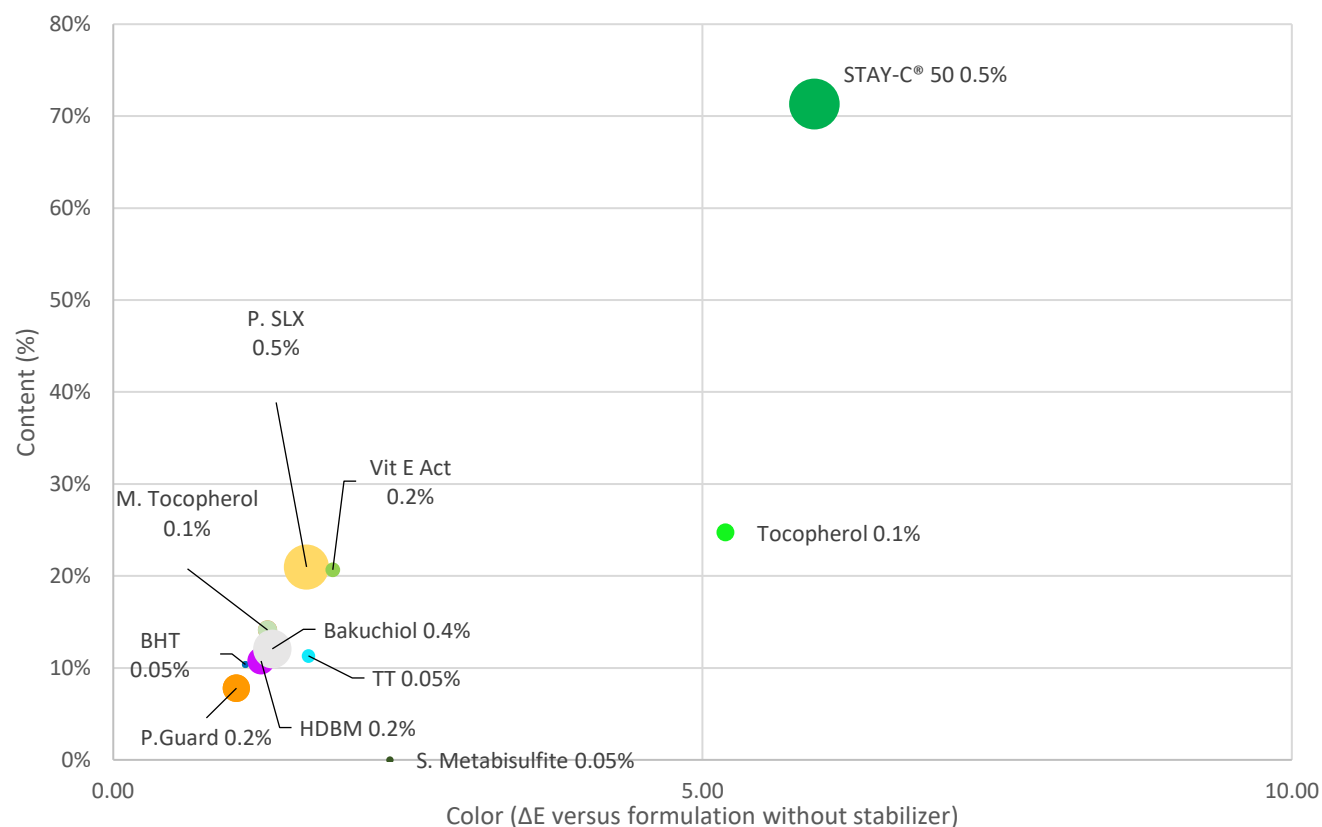
*: valid also for Retinol GS 50

*INCI Name: Octocrylene (and) Homosalate (and) Butyl Methoxydibenzoylmethane (and) Tocopherol (and) Helianthus Annuus (Sunflower) Seed Oil

Retinol and Stabilizers

Stability after 6 weeks at 40°C versus formula with Retinol* only

Retinol Stabilizers x Color x Cost in use



Mixed Tocopherol 95 is a natural replacement to BHT with equivalent performance to recover Retinol content.

No sample stored at 40°C had a recovery content higher than 25% of initial value, except STAY-C® 50 with 70% recovery.

There is not a visual discoloration impact in the sample with STAY-C® 50 comparing to Retinol GS 50 only at RT and a slight discoloration at 40°C.



Vitamin C - The Retinol Protector

Retinol recovery content with STAY-C® 50 -3 month

RT



Retinol GS 50
Without stabilizer

40°C



Retinol GS 50
Without stabilizer



Retinol GS 50
STAY-C® 50 at 0.5%



Retinol GS 50
STAY-C® 50 at 0.5%

Retinol is highly sensitive to temperature, after 6 weeks at 40°C STAY-C® 50 was the best stabilizer tested with 70% retinol content

STAY-C® 50 recovers retinol content by 78% at RT and by **52%** at 40°C after 3 month stability.

None of the other 12 stabilizer tested stored at 40°C had significant recovery content after 3-month stability.

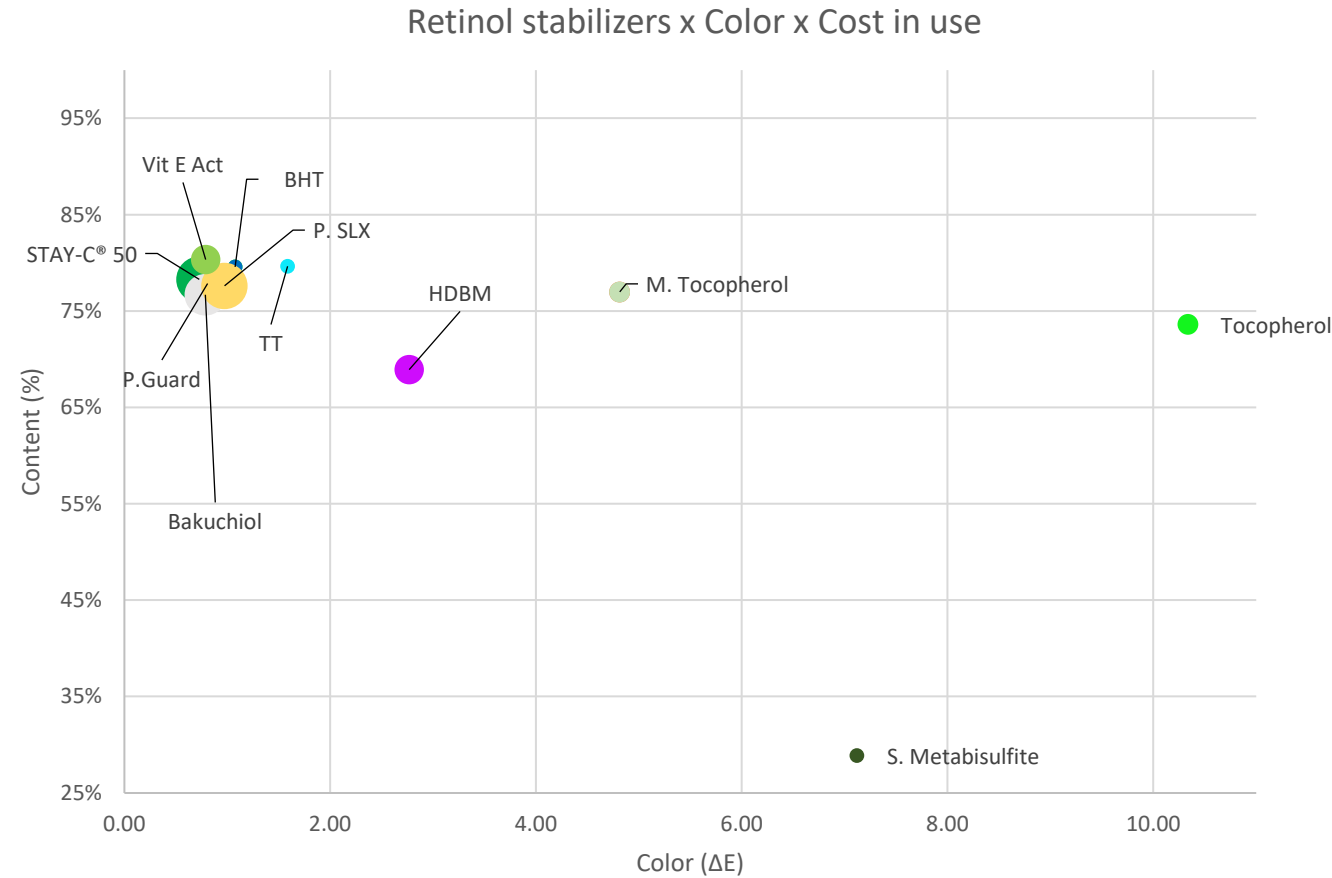
There is not a visual discoloration impact in the sample with STAY-C® 50 comparing to Retinol GS 50* only at RT and a slight discoloration at 40°C.

DSM Nutritional Products
own study

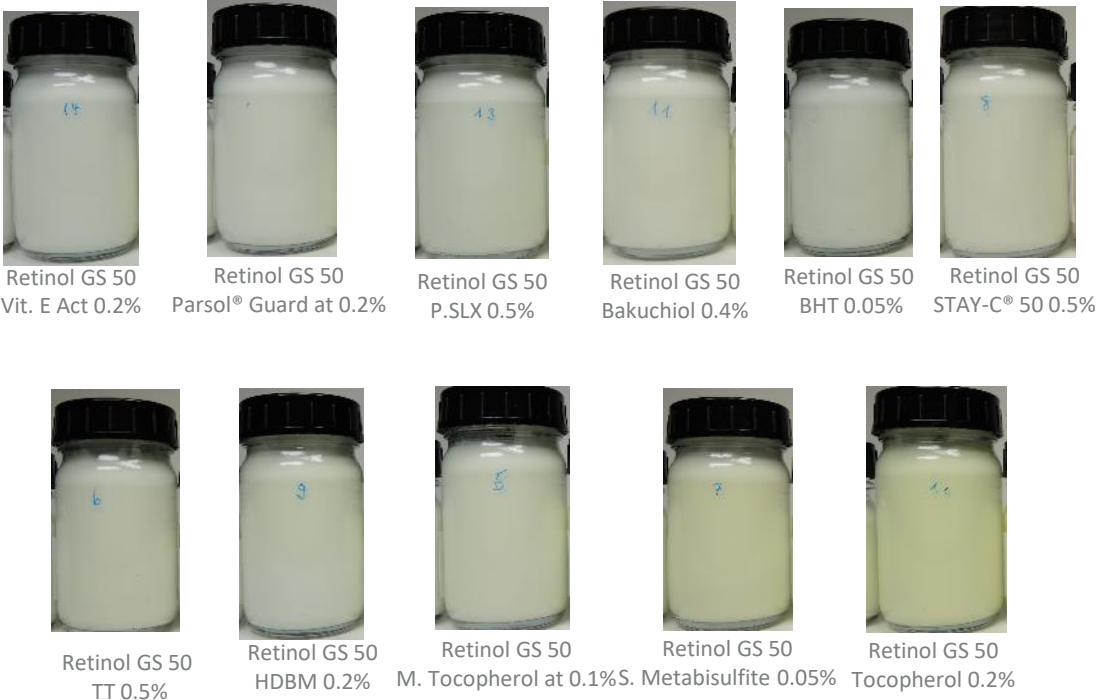
*: Retinol GS 50 or Retinol CB 50

Retinol* and Stabilizers

Stability after 3 month at RT versus formula with Retinol only



3 month at RT



*: Retinol GS 50 or Retinol CB 50

Magnificent Oil Gel Formulation

The Oil Gel contains a dual form of **VITAMIN A** to visibly reduce the appearance of lines and wrinkles while improving firmness and elasticity of the skin.

INGREDIENTS	INCI NAME	%W/W
Eutanol® G	OCTYLDODECANOL	47,85
Myritol® 318	CAPRYLIC/CAPRIC TRIGLYCERIDE	47,85
Mixed Tocopherols 95	TOCOPHEROL	0,20
DL-alpha-Tocopheryl Acetate	TOCOPHERYL ACETATE	0,50
Oilkemia™ 5S Polymer	CAPRYLIC/CAPRIC GLYCERIDES, POLYURETHANE-79	3,00
RETINOL GS 50*	RETINOL, POLYSORBATE 20, BHT, BHA	0,30
Vitamin A Palmitate 1.7 MIU/g tocopherol	RETINYL PALMITATE, TOCOPHEROL	0,30

SK-E-101695-11

The **Mixed Tocopherols 95**, a natural form of vitamin E, acts as an anti-oxidant prolonging Retinol performance.

*: Retinol GS 50 or Retinol CB 50



Cocooning Vitamins Mask Soap

*Formulation: 99.89% natural origin**

A cocooning face mask soap with Retinol, the golden standard of pro-ageing reducing the appearance of lines, improving firmness of the skin, and stabilized vitamin C for a glowing and purified skin.

	Ingredients	Function	% w/w
A	Prunus Amygdalus Dulcis Oil	Emollient	14.60
	Passiflora Incarnata Seed Oil	Emollient	14.60
	Persea Gratissima Oil	Emollient	6.10
	ARGAN OIL (Argania Spinosa Kernel Oil)	Emollient	3.00
	Theobroma cacao Seed Butter	Emollient	3.70
	Macadamia Integrifolia Seed Oil	Emollient	14.60
	Life's GLA™ '10' n-6 Oil (Oenothera Biennis Oil, Ascorbyl Palmitate, Tocopherol)	Emollient, Active	2.00
	Ricinus Communis Seed Oil	Emollient	2.00
B	Kaolin	Absorbing agent	10.00
	VALVANCE® Look 100 (Silica, Titanium Dioxide)	Sensory Modifier, Whitener	3.00
	CI 77891, Polyglyceryl-2 Tetraisostearate	Pigment	2.00

	Ingredients	Function	% w/w
C	Sodium Hydroxide	Buffer	7.60
	Aqua	Solvent	14.20
D	RETINOL CB 50 (Retinol, Undecane, Tridecane, Tocopherol)	Active	0.20
	STAY-C® 50 (Sodium Ascorbyl Phosphate)	Active	0.50
	Tocopherol, Helianthus Annuus Seed Oil	Active	0.20
	PENTAVITIN® (Saccharide Isomerate, Aqua, Citric acid, Sodium Citrate)	Active	1.00
	Parfum	Parfum	0.70

SK-E-102144-10

Technical data

pH: 10.79

Viscosity: Solid

* Natural origin content calculated according to ISO 16128 by including formulation water

*Access to learn more about DSM
Quali® Vitamin A and to request
a sample*



BRIGHT SCIENCE. BRIGHTER LIVING.™



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