ISSUE OCTOBER 2014

COSMETOPOLITAN

RAHN
Your partner for excellence

Dear customer,

Following the positive response to the first edition of Cosmetopolitan a new issue comes with a warm welcome to its readers.

A magazine is nothing without you and we would like to thank you, in advance, for your input. By sharing your views, you help us to grow the Cosmetopolitan into a highly useful and interesting tool, as we strive to create a magazine that is for cosmetics, by cosmetics.

Enjoy your reading!

Sandra Gut
from your RAHN-Team

WHO
IS NEW?

A warm welcome to our new team colleagues:

ROLAND JERMANN
Function
Technical Sales Manager
Division
Cosmetics
Joining
2 June 2014

JOËLLE CIVRILLI
Function
Customer Service (60%)
Division
Cosmetics
Joining
1 July 2014

INSA WALLER
Function
Trainee
Division
Cosmetics
Joining
18 August 2014
(6 months temporary employment)

TATJANA RODSEWYTSCH
Function
Technical Marketing (50%)
Division
Cosmetics
Joining
8 September 2014

CHIARA DEGL'INNOCENTI
Function
Export Manager
Division
Cosmetics
Joining
22 September 2014

We wish our new colleagues a good start and look forward to a successful and productive working relationship.

RAHN-Application lab
meets the UK

We are happy to announce that in August 2014 RAHN opened a UK Application Laboratory, which is in addition to our long established Zurich Application Laboratory.

As a service department of RAHN, the UK Application Laboratory will provide new insights into dealing with our own cosmetic raw materials, as well as those from our suppliers. The aim is to offer customers innovative guide formulations, and answer technical questions quickly and efficiently. Meanwhile, the once very formula-oriented laboratory has developed into a flexible and comprehensive service pool. Telephone advice on new developments or problem queries and custom development work are just as important as sending out product samples and suggestions for claims.

This expansion of the Application Laboratory Department gives us greater ability to satisfy the local customer needs.

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c/o Leatherhead Food Research
Randalls Road, GB-Leatherhead, Surrey KT22 7RY

Roman Ott, Sandra Gut, Andrew Childs, Sarah Gladstone, Adrian Gräub

… when the consistency
becomes too firm!

What is the secret of a stable emulsion?

Often the influence of the droplet size is underestimated or not even considered. The droplet size may play an important role within emulsions in terms of their viscosity and stability.

Who doesn't know this sight? The scaling-up of laboratory batches into production in particular can cause significant differences in terms of the viscosity or structure of an emulsion. This phenomenon occurs when the internal phase of an emulsion (here: O/W) is more finely distributed (= smaller droplets), for example through greater homogenization.

Viscosity increases / Structural changes

Moving to scale up can be a mathematical juggle of forces if you aim to keep the same product properties such as viscosity. In general the homogenization performance within a production process is significantly higher than in the laboratory when working, for example, with an Ultra-Turrax.

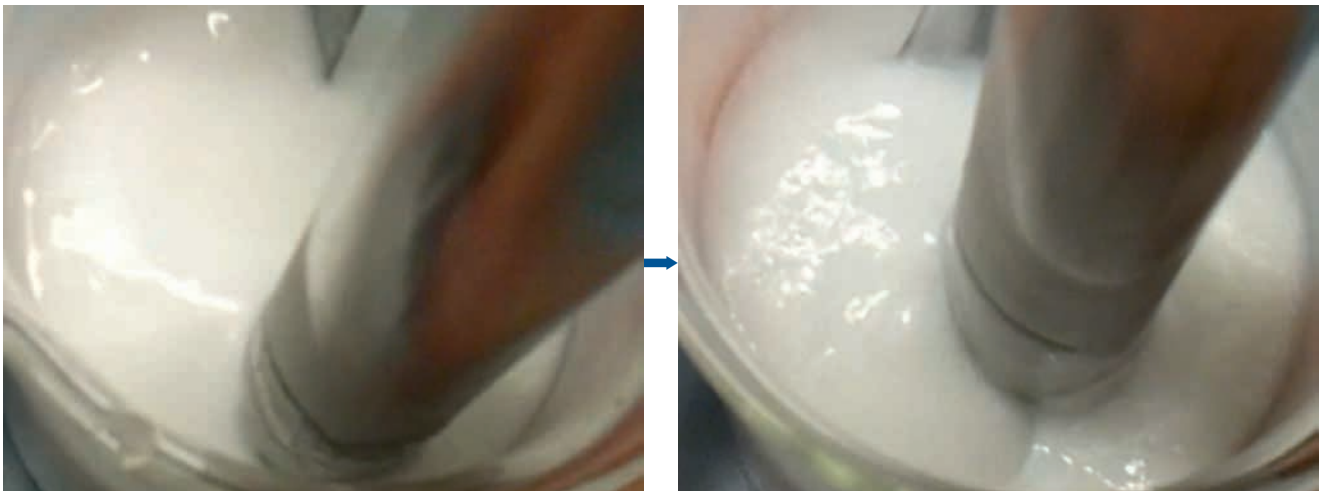
When the much finer oil drops converge in the system, the steric hindrance can lead to an increase in viscosity. This does not always have to lead to an oil separation, but can also merely remain as a change in consistency. This in particular is a frequent occurrence in practice, which means that a milky lotion can convert into a cream or even into a butter.

If the droplets formed in the laboratory are finer than those formed during production, higher viscosity creams can end up being a very free-flowing lotion. Both of these variants are disadvantageous, because the end product is not what was originally developed and tested for its stability in the laboratory.

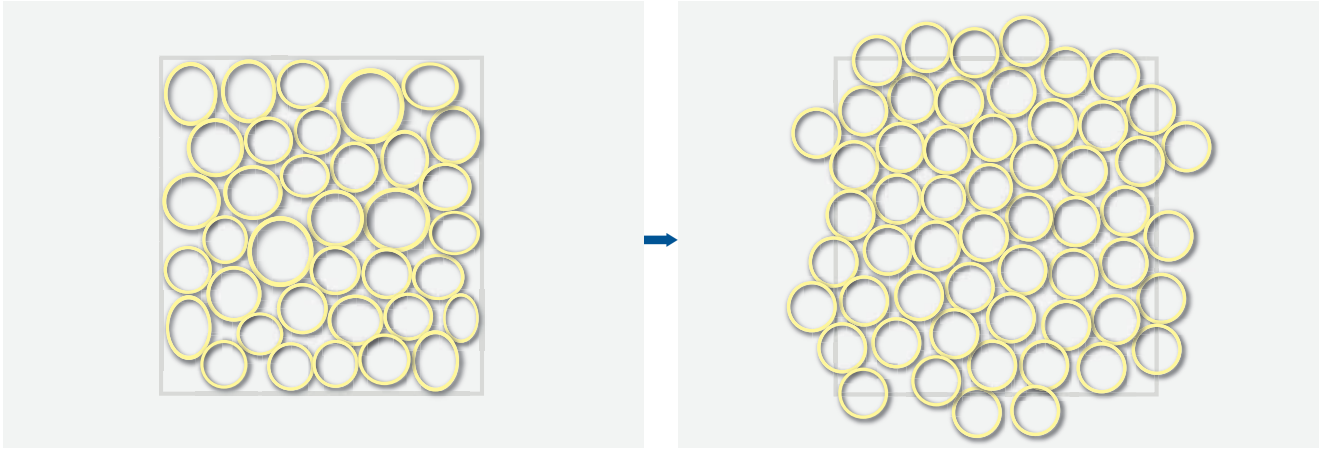
Immediate instability / Oil separation

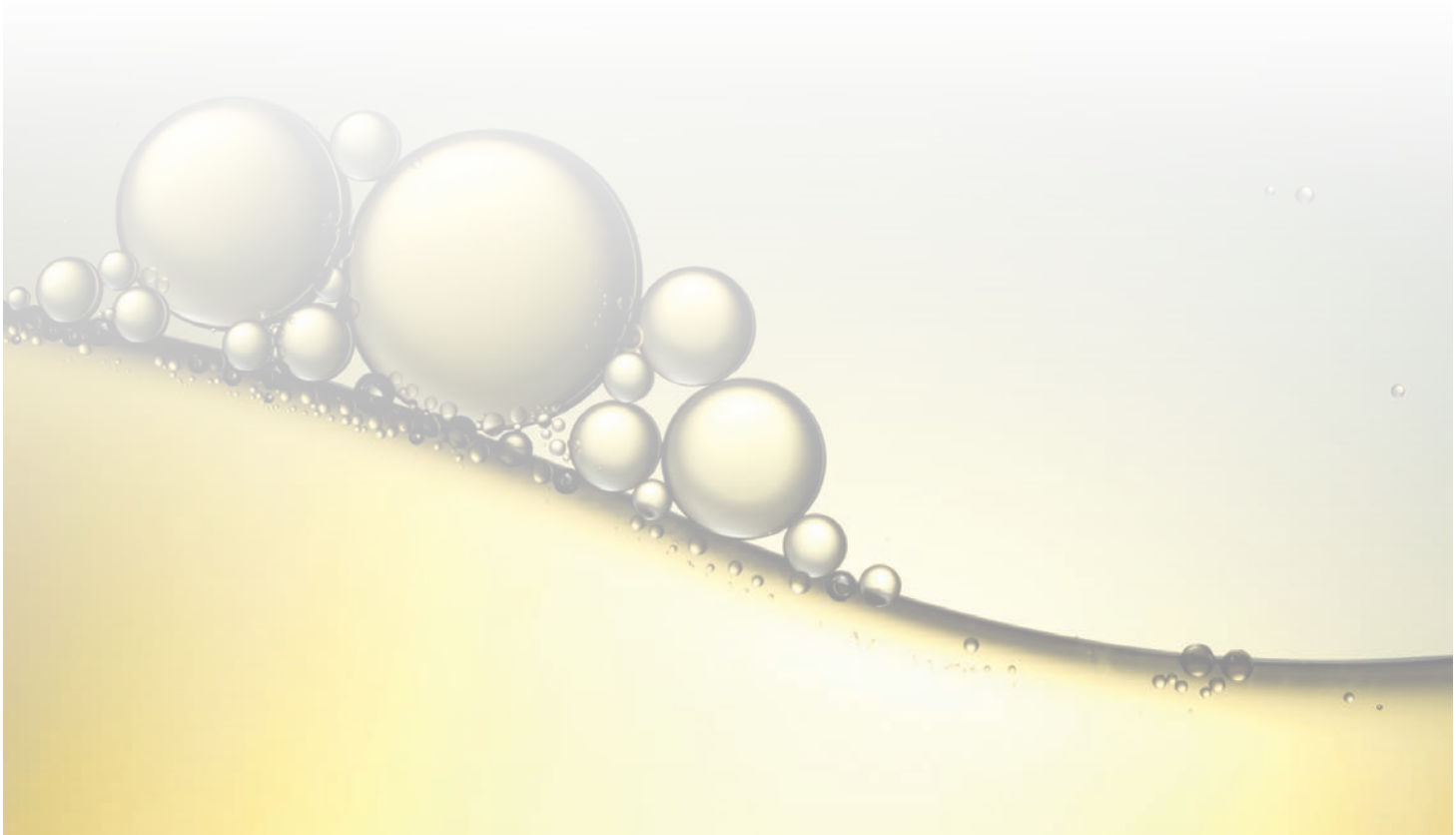
It is a well-known fact that the homogenization of an emulsion and the resultant reduction in the size of the droplets lead to a change in the surface structure. The laboratory experiment below shows this change which can be caused if the energy input is too high. The picture on the right shows that the consistency is curd-like, while at the same time the viscosity of the emulsion substantially increases and the oil begins to separate out.

The illustration shows the reduction in the size of the oil droplets and the simultaneous increase in size of the oil phase. This causes a shortage of space, in other words the oil phase with the more finely distributed droplets simply has too little room within the emulsion, and is thus at least partially forced out of the system.



Examined more closely, the following takes place:





This phenomenon can occur to an increased extent if there is a strong gel network (Carbomers, Xanthan Gum, etc.) in the water phase. As a result of the gel-forming agents binding with the water phase, they swell and consequently demand more space in the system.

In conclusion we can say that a finer and more consistent droplet size usually tends to lead to better stability. Attention should however be paid to ensuring that the droplet sizes of the laboratory and production approaches are comparable; this is a stability criterion which is worth paying closer attention to.

Sun care today

The formulation of sun care products is generally a very complex matter. One of the major challenges consists in finding the right balance between a light and non-sticky skin feel, good dispersion on the skin, as far as possible no whitening effect and yet a high sun protection factor. In addition, the cream needs to be cost-efficient and must display good market acceptance in terms of its toxicology and effectiveness.

Modern sunscreen products usually have a so-called broadband filter; the organic or physical ingredients mean that both UV-B and UV-A are absorbed and reflected respectively. The higher the requirements are for the sun protection factor of a formulation, the more difficult it becomes to fulfil the corresponding SPF level in a product that will also offer good water resistance and still be pleasant to use. One important criterion for good and efficient UV protection is the photostability of the UV filter.

Photounstable UV filters break down when exposed to solar irradiation, and at the same time they also undergo a radical reaction, both amongst themselves and also with suitable reaction partners in the formulation and in the molecules of the epidermis. The raw material Synoxyl HSS manufactured by Sytheon* can provide help in dealing with this problem of photoinstability.

Synoxyl HSS is not a UV filter in itself, but comes under the category of stabilizers, and offers good SPF-boosting properties while at the same time serving to protect the DNA. It also functions as an antioxidant and complex-forming agent. The effectiveness of Synoxyl HSS has been ascertained and confirmed by means of SPF measurements in accordance with the EU standards.

* http://sytheonltd.com/

A framework formula prepared by RAHN was revised by testing a placebo version against a version with 2% Synoxyl HSS.

Raw material	INCI	Placebo %	Version 1 %
Water demin.	Aqua	57.50	55.50
Disodium EDTA	Disodium EDTA	0.10	0.10
Glycerin 86%	Glycerin, Aqua	4.00	4.00
Carbopol Ultrez 20	Acrylates/C10-30 Alkyl Acrylate Crosspolymer	0.25	0.25
Dermofeel GSC	Glyceryl Stearate Citrate	2.50	2.50
Tego Alkanol 6855	Cetearyl Alcohol	1.50	1.50
Tegosoft XC	Phenoxyethyl Caprylate	8.00	8.00
Eusoles HMS	Homosalate	10.00	10.00
Eusolex OS	Ethylhexyl Salicylate	5.00	5.00
Uvinul T150	Ethylhexyl Triazone	1.00	1.00
Parsol 1789	Butyl Methoxydibenzoylmethane	3.00	3.00
Synoxyl HSS	Trimethoxybenzylidene Pentanedione	–	2.00
Keltrol CG-SFT	Xanthan Gum	0.15	0.15
L-Arginine sol. 10%	Arginine, Aqua	2.00	2.00
Versatil PC	Phenoxyethanol, Caprylyl Glycol	1.00	1.00
Ethanol 96%	Alcohol	3.00	3.00
Baycusan C1000	Polyurethane-34	1.00	1.00
Test data	pH value	5.9	5.9
	Centrifuge test (20 min/4000 rpm)	good	good
	Droplet size in micrometer (by microscope)	2-10	2-10
	SPF in-vivo (EU Standard ISO 24444:210)	Mean 13.3	Mean 30.2
	Labelled SPF (EU Recommendation 2006)	SPF 10	SPF 30
	PCD EU Recommendation 2006	Low protection	High protection
	UVA PF in-vitro (EU Stand. ISO 24443:2012)*	5.7	25.6
	UVAPF/SPF Ratio (%), min. 33%	57%	85%

*UVA measurement showed some unusual curves and should not be seen as strict data therefore

The formulation is based on homosalates and ethylhexyl salicylate, which are stable but not very efficient UV-B filters. Stabilization using Synoxyl HSS can achieve a boosting effect. Ethylhexyl triazone, on the other hand, is an efficient UV-B filter and thus has a major influence on the actual SPF value. Butyl methoxydibenzoylmethane is a photounstable UV-A filter, which is also stabilized by means of Synoxyl HSS.

Both formulations underwent the same testing procedure. The measurement results are remarkable, showing that the sun protection factor can be boosted from SPF 10 to SPF 30. Synoxyl HSS is thus an effective additive, especially in formulations containing photounstable UV filters.

It is also worth mentioning that the tested emulsion is free from nanoparticles and pigments, and does not contain any PEGs or critical octocrylene. The formulation is light, non-whitening and feels pleasant on the skin.

Synoxyl HSS – a raw material that is worth trying!

PROFILE: SYNOXYL HSS

INCI	Trimethoxybenzylidene Pentanedione
Suggested use level	1.5–2.0%
Solubility	>30% DMI
	~20% in ethanol
	~20% in PEG-300
	~10% in HMS
	~10% in Synovea DOI
	~10% in Tween 20
	~7% in Polysorbate 80
	~5% in C12-15 Alkyl Benzoate
Function	Stabilizer, SPF booster
Benefits	Strong SPF booster (up to +50% with 2% usage level)
	Excellent stabilization for retinol, vitamin E and vanillin
	DNA protection
	Antioxidant
	Chelating agent
Application field	Sun care products

BASIC SUN CREAM

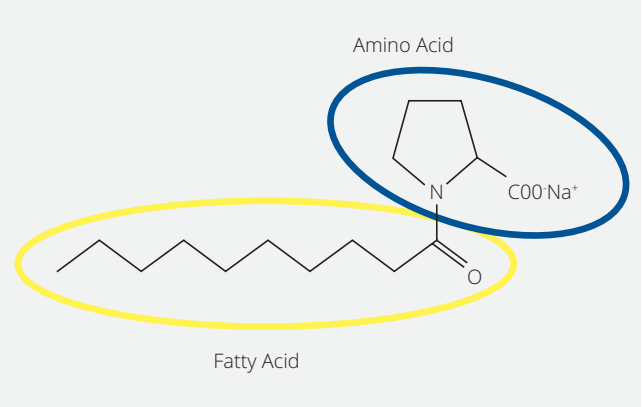
St	Substance	INCI name USA	% [w/w]	Manufacturer
1	Water demin.	Water	56.60	several
	Glycerin 85%	Glycerin, Water	4.00	several
2	Carbopol Ultrez-20	Acrylates/C10-30 Alkyl Acrylate Crosspolymer	0.25	Lubrizol, US
3	Dermofeel GSC	Glyceryl Stearate Citrate	2.50	Dr. Straetmans, DE
	Tego Alkanol 6855	Cetearyl Alcohol	1.50	Evonik Industries AG, DE
	Tegosoft XC	Phenoxyethyl Caprylate	8.00	Evonik Industries AG, DE
	Neo Heliopan HMS	Homosalate	10.00	Symrise, DE
	Neo Heliopan OS	Ethylhexyl Salicylate	5.00	Symrise, DE
	Uvinul T 150	Ethylhexyl Triazone	1.00	BASF, DE
	Parsol 1789	Butyl Methoxydibenzoylmethane	3.00	DSM, NL
	Synoxyl HSS	Trimethoxybenzylidene Pentanedione	2.00	Sytheon Ltd, US
	Keltrol CG-SFT	Xanthan Gum	0.15	CP Kelco, US
4	L-Arginine solution 10%	Water, Arginine	2.00	Ajinomoto, JP
5	Verstatil PC	Phenoxyethanol, Caprylyl Glycol	1.00	Dr. Straetmans, DE
	Ethanol 94% denat.	Alcohol, Water	3.00	seveval

Multifunctional

Prodew P-DS-12

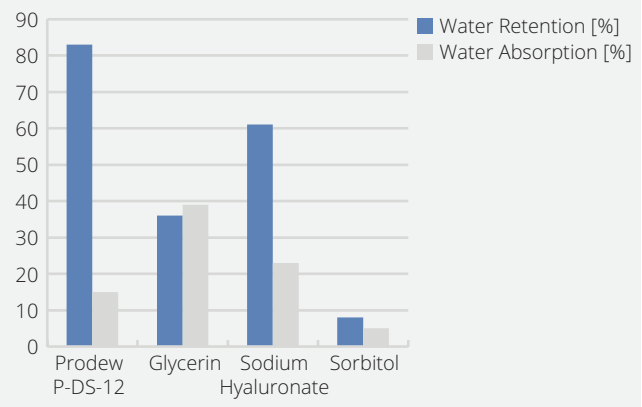
My name is PRODEW P-DS-12 and I am a multifunctional raw material produced by Ajinomoto* for the cosmetic industry. I am composed of sodium caproyl prolinate and water. In addition I am colourless and odourless, and am thus extremely versatile and simple to use.

The component sodium caproyl prolinate is the amalgamation of a fatty acid with the amino acid L-Prolin. From a chemical perspective this looks as follows:



Capric acid serves as a fatty acid here. It is present in relatively high proportions in some plant oils and exhibits refatting properties. As an example, it is found in coconut oil.

I have an especially pronounced effect as a humectant. This is shown by various measurements of the skin's WATER RETENTION and WATER ABSORPTION. The diagram below indicates the measurement results of Prodew P-DS-12 compared to glycerine, sodium hyaluronate and sorbitol.



* http://www.ajinomoto.com/en/

I am regarded as multifunctional, since as well as my remarkable activity as a humectant, I can also intensively increase the antimicrobial effect of preservatives or alternative preservatives. I behave especially efficiently in combination with glycols, as well as in compounds such as phenoxyethanol, phenethyl alcohol or ethanol. In the laboratory I have been tested for my effectiveness in various tonic formulations with different preservative systems:

Ingredient	Tonic 1	Tonic 2	Tonic 3	Tonic 4	Tonic 5
Water demin.	94.20	94.20	94.70	90.10	95.20
Glycerin 99.5%	2.00	2.00		4.00	2.00
Prodew P-DS-12[A)]		1.50	1.50	1.50	1.00
Dermosoft OMP[B)]	3.00	1.50			
Pentylene Glycol			2.50		
Ethanol 94%				3.00	
Phenoxyethanol					0.60
Sodium Citrate	0.20	0.20	0.20	0.22	0.20
Citric Acid Sol. 10%	0.60	0.60	1.10	1.18	1.00
pH	5.5	5.5	5.0	5.0	5.0
Microbiological test result	**AAAAA**	**AAAAA**	**AAAAB**	**AAAAA**	**AAAAA**

A) INCI: Sodium Caproyl Prolinate

B) INCI: Methylpropandiol, Caprylyl Glycol, Phenylpropanol

The tonic formulations have been subjected to a test for adequate preservation according to the European Pharmacopeia. The following organisms are part of the method: *Staphylococcus aureus; Pseudomonas aeruginosa; Escherichia coli; Candida albicans; Aspergillus brasiliensis*. The formulations were incubated for 2, 7, 14 and 28 days with the test bacteria and the subsequent results given either an A, B or C-criterion, the latter being is an insufficient result.

The microbiological test results clearly show that I am very well suited for paraben-free or preservative-free developments, as well as those that conform to natural cosmetics guidelines.

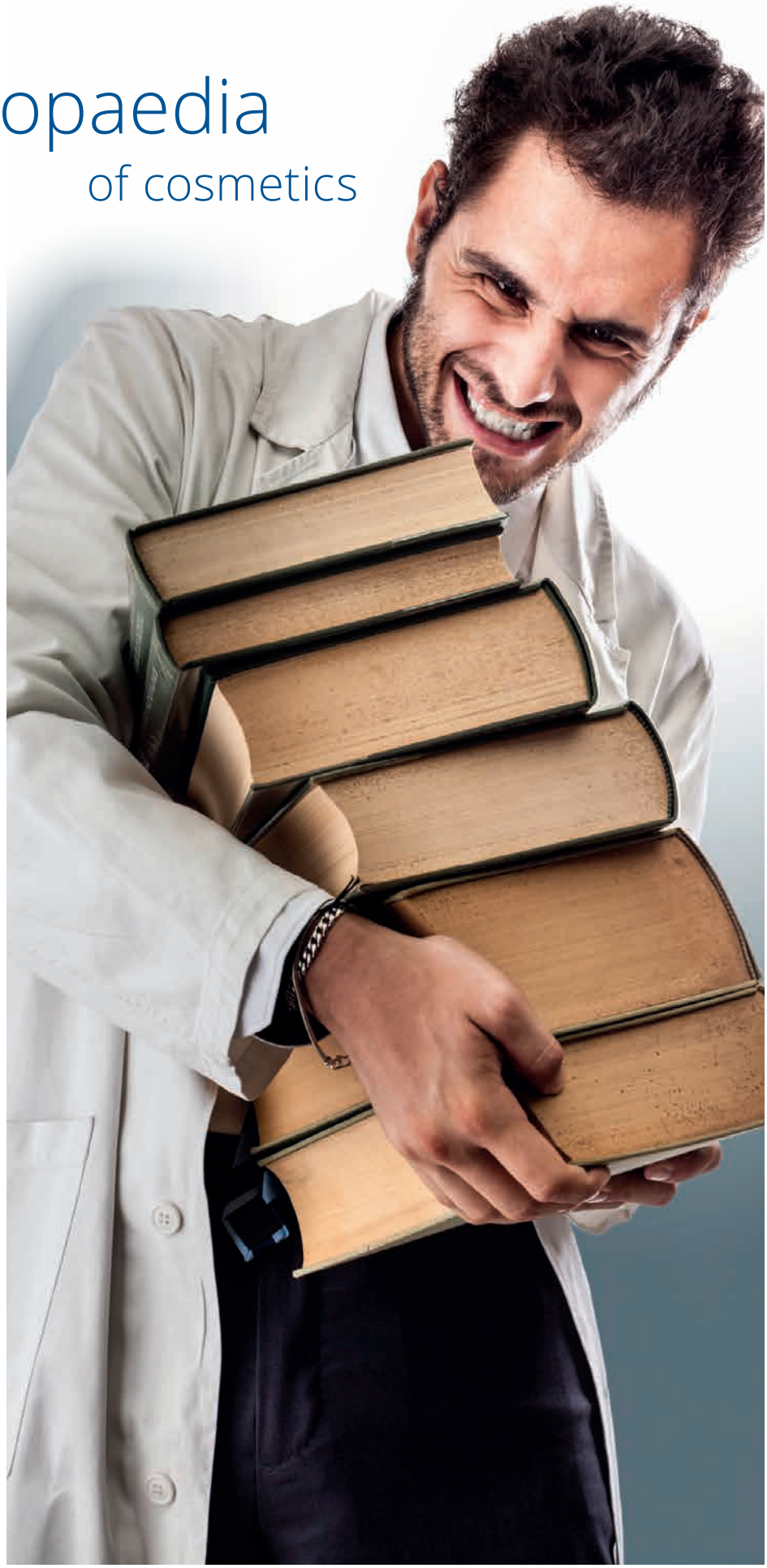
PROFILE: PRODEW P-DS-12

INCI	Sodium Caproyl Prolinate (30%) Water (70%)
Usage level	0.5–1.5%
Solubility	Water soluble
Function	Humectant with antimicrobiological ancillary effect
Benefits	Suitable for Natural Cosmetics
	Cost efficient
	Easy to handle
	Cold processable
	Proven synergy with Polyols (e.g. Propandiol, Butylene Glycol, Pentylene Glycol) and Benzoic alcohols (e.g. Phenetylalcohol, Phenoxyetanol)
Application field	Toner, Tonics, Gels, O/W-Emulsions or Rinse-off products with a small oil or surfactant phase

BASIC FACE TONIC

St	Substance	INCI name USA	% [w/w]	Manufacturer
1	Water demin.	Water	94.20	several
	Glycerin 99.5%	Glycerin, Water	2.00	several
	Prodew P-DS-12	Sodium Caproyl Prolinate, Water	1.50	Ajinomoto, JP
	Dermosoft OMP	Methylpropanediol, Caprylyl Glycol, Phenylpropanol	1.50	Dr. Straetmans, DE
2	Sodium Citrate	Sodium Citrate	0.20	several
	Citric Acid solution 10%	Citric Acid, Water	0.60	several

The encyclopaedia of cosmetics



A is for ...

...**A**brasive

...**A**bsorption

...**A**lginates

...**A**llantoin

...**A**llergens

...**A**nionic Surfactants

...**A**ntimicrobial

...**A**ntioxidants

...**A**pplication

...**A**rginine

Abrasive

Is the surface-removing property of a particular substance, for example peeling particles. The more abrasive, the greater the "sanding effect" on the skin, and the more dead skin cells are removed.

Absorption

Is the agglomeration of substances in the uppermost layer of the skin or hair.

Alginates

These belong to the group of polysaccharides, and are obtained from brown algae. In cosmetics they are used as natural thickening substances, for example in skin gels, face masks and toothpastes.

Allantoin

Allantoin, or chemically 5-Ureidohydantoin, is an active substance contained in animal and human urine. It provides wound-healing and cell-regenerating properties, and because it is well tolerated by the skin it is a proven substance for skin that is sensitive and prone to inflammation.

Allergens

Substances that can induce an allergic reaction in people who are sensitized and can provoke defensive reactions in the organism through the immune system. This frequently applies to cosmetic components such as the elements in perfume oils, preservatives or colorants.

Anionic Surfactants

A surfactant molecule consists of a hydrophobic part, which combines with fat or dirt on the skin surface, and a hydrophilic head, which combines with water and thus ensures that the whole substance can be washed off again. The chemical structure determines the respective surfactant effect. Anionic surfactants have a negatively-charged head; this form of surfactant is used most frequently in the cosmetic and detergent industry, on account of its excellent cleaning and foaming properties.

Antimicrobial

The effect of substances such as preservatives which inhibit the growth of microorganisms such as bacteria, yeasts and fungi.

Antioxidants

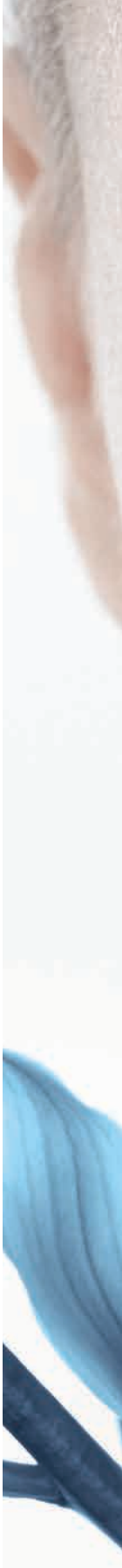
An antioxidant protects a cosmetic product from spoilage by reaction with oxygen.

Application

Use or administration of a substance, for example on the skin.

Arginine

Belongs to the amino acid group and can comprise up to 7 % of the connective tissue fibres (collagen) of the human body. Arginine is produced through the fermentation of carbohydrates / saccharides of natural origin, and is regarded by the cosmetics industry as an excellent active substance for hair and skin care products. Arginine also acts as a neutralizing agent analogously to sodium hydroxide.



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