

Public
CC
Personal Care
1502.200



Mild Surfactants

Clariant Mild Surfactants for Personal Care Applications



Exactly your chemistry.

Test Methods: How to assess mildness

Chemical-physical Tests

**Surface Tension
(CMC)**

Interfacial Tension

Lather

Thickening

Solubility

Wetting

Detergency

In Vitro-Tests

**Red Blood Cell
Test**

Zein Test

**HET - CAM
Test**

In Vivo-Test

**Elbow Bend Wash
Test**

Laserprofilometrie

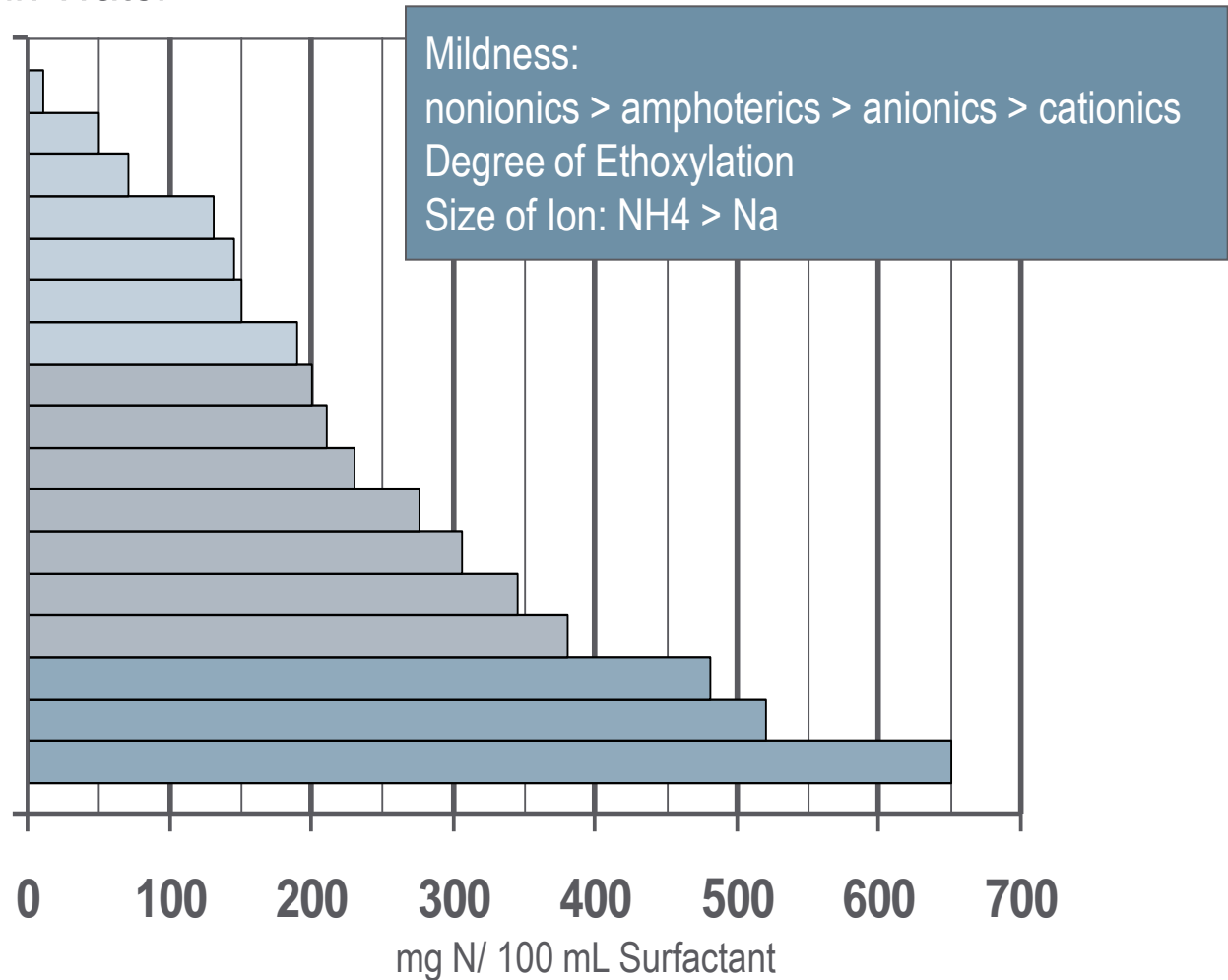
**Duhring Chamber
Test**

Patch Test

Zien Values of different surfactants

1% Active Ingredient in Water

APG C12/14
Alkylamphoacetate
CAPB
MgLES+ 3EO
Sodium Cocoyl Isethionate
Ethercarboxylic acid C12/14
SLES+ 3 EO
Sulfosuccinate
Sodium Cocoyl Glutamate
Sodium Lauroyl Glutamate
Sodium Methyl Cocoyl Taurate
SLES+ 2 EO
Sarcosinate
Sodium Alkyl Sulfonate
Soap
SDS
ABS



Mild surfactants to meet every application need

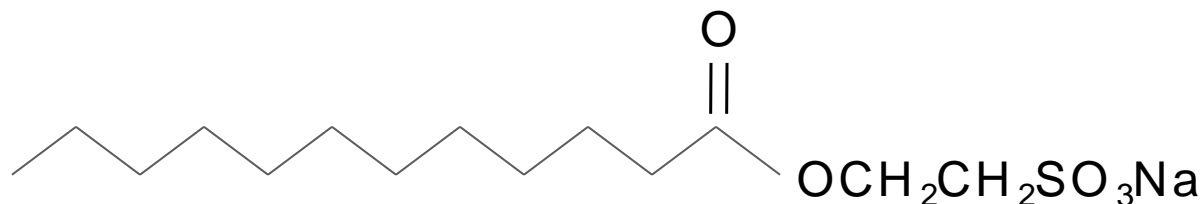
- Hostapon® SCI Sodium Cocoyl Isethionate
- Hostapon® KCG Sodium Cocoyl Glutamate
- Hostapon® CT Methyl Taurates
- Genagen® KB Coco-Betaine
- Genagen® CAB Cocamidopropyl Betaines
- Genagen® 3SB: Optimized surfactant blend
- Emulsogen® Ether Carboxylates

*Hostapon[®] SCI Sodium
Cocoyl Isethionate*

Hostapon[®] SCI

INCI: Sodium Cocoyl Isethionate

Mild, high-foaming, anionic surfactant



- Excellent mildness to skin
- Dense, stable foam – rich, creamy lather
- Good hard water tolerance
- Excellent eco-tox profile
- Easy to handle physical form
- Ideal for use in cleansing bars
- Rinses free from skin, with silky skin afterfeel
- Leaves no soap scum

Hostapon[®] SCI Grades

- Hostapon[®] SCI-85
 - min. 84% active
 - chip (flake), granules or powder

- Hostapon[®] SCI-65
 - 64 – 68% active
 - blended with stearic acid
 - chip

Hostapon[®] SCI product forms

CHIP



~ 5 cm wide
.2 cm thick

Hostapon SCI-85C
Hostapon SCI-65C

GRANULES



Between
10 & 20 mesh
screen or
2 & 850 microns

Hostapon SCI-85G

POWDER



97% through
a 60 mesh
screen or
< 250 microns

Hostapon SCI-85P

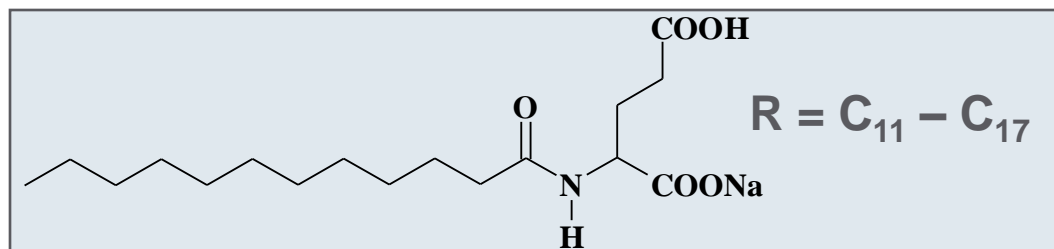
Applications of Hostapon SCI

- Mild anionic surfactant used in cosmetics and toiletries
- Bar Cleansers
 - Due to its poor solubility in water at r.t. (~ 0.1 weight-%) Sodium Cocoyl Isethionates are mainly used in Syndet and Combo Bars
- Other applications (both clear and pearlized) include:
 - Liquid soaps
 - Facial-wash formulations
 - 2 in 1 Shampoos / shower bath emulsions
 - Toothpaste
- Easy to use for liquid formulations:
 - Add to HOT water (75°C). Stir. After 10 min clear solution is obtained
 - Add the other surfactants and ingredients.

Hostapon[®] KCG
Sodium Cocoyl Glutamate

Hostapon[®] KCG

INCI: Sodium Cocoyl Glutamate



Applications

- All types of mild foaming products, such as:
- Gentle shampoos
- Foaming facial cleansers
- Bubble baths
- Mild shower gels
- Liquid soaps of all kinds
- Syndet and combo soap bars
- Shaving foams

Benefits

- Very mild
- High foaming power, especially at acidic pH
- Low viscosity as supplied: excellent for Airspray[®] formulations
- Reduces skin (hair?) adsorption of SLES resulting in increased skin moisture and improved feel

Nivea Bath Care

Moisturizing Body Wash, 2 in 1 Cleanser & Moisturizer, Enriched Care

Ingredients

Water, Sodium Laureth Sulfate, Cocamidopropyl Betaine, Glycol Distearate, **Sodium Cocoyl Glutamate**, PEG-7 Glyceryl Cocoate, PEG-8 Dimethicone Copolyol, Cetyl Alcohol, Fragrance, Glyceryl Laurate, Laureth-4, Hydroxypropyl Guar Hydroxypropyltrimonium Chloride, Citric Acid, Acrylates/C10/C10-30 Alkyl Acrylate Crosspolymer, EDTA, Sodium Hydroxide, Phenoxyethanol, Methylidibromo Glutaronitrile

Claim

With Nivea Moisturizing Body Wash you can **cleanse and moisturize** at once, right in the shower.

Nivea Moisturizing Body Wash has a rich, **creamy lather** that cleanses as well as soap and yet is **very mild** to your skin.

As you cleanse, skin-softening Nivea Moisturizers **smooth** away dry skin. Your skin feels **moisturized and smooth**. Great for normal to **dry skin**.

Made with ingredients which work in harmony with your skin, to bring out its natural beauty.



XXIst IFSCC International Congress 2000, Berlin – Proceedings

XXIst IFSCC International Congress 2000, Berlin – Proceedings

Reduction Of Skin's Surfactant Adsorption: An Effective Way To Improve Mildness And Performance Of Bath Care Products

Martin Sugár, Robert Schmucker

Beiersdorf AG, R & D cosmed, Hamburg, Germany

Background
Personal care products like shower or bath gels are mainly water based formulations with a high content of anionic surfactants and a low content of amphoteric or nonionic co-surfactants. It is well known from literature that the application of anionic surfactants can lead to skin-related reactions like increased transepidermal water loss (TEWL) or reduced skin capacitance (1, 2, 3), as well as to severe skin irritation (4, 5). The above mentioned "side-effects" of anionic surfactants usually occur either after repeated or prolonged exposure of the skin. Therefore it is one of the major purposes regarding the "necessary" for the application of surfactants, which could be based on the adsorption and concentration of surfactants. In the literature, adsorption of anionic surfactants on skin has been investigated.

Material and Methods
Vitality tests of the products were divided into test series with including type: The test series were examined with same test series. Additionally, the test series were applied and distributed by performing a circular motion with the fingertips. After 30 minutes, the test series were removed off the test series. In the skin, the skin was washed by a mild surfactant solution.

Results
The amount of SLES on the skin after one hour of application was not significantly reduced. All test series showed similar results. The amount of SLES on the skin was 1.2 µg SLES per cm² of skin. The detected amount was shown in a histogram in Figure 1. The amount of SLES detected on the skin ranged between 0.5 and 1.5 µg/cm² for the majority of the test subjects.



Figure 1: Amount of SLES detected on the skin (µg/cm²)

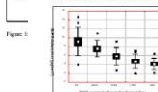


Figure 2: Effect of the addition of different concentrations of SLES to standard shower formulations on SLES adsorption

Standard work test was performed to compare the effect of SLES-containing and SLES-free shower formulations. This is shown in Figure 4. The other test series of the study were significantly lower in adsorption than the standard work test. Formulations that were SLES-free. Note that the SLES concentration is not included in the SLES-containing formulations. In addition to the improved mildness, sensory evaluation revealed that the SLES-containing formulations also showed superior performance with respect to ease of lathering and skin feel.

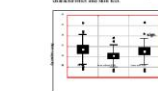


Figure 3: Effect of the addition of SLES to a SLES-containing standard shower formulation on skin desiccation as measured by skin capacity

Reduction Of Skin's Surfactant Adsorption: An Effective Way To Improve Mildness And Performance Of Bath Care Products

Martin Sugár, Robert Schmucker

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Discussion

It was shown that the anionic surfactant **SLES** possesses a high substantivity to human skin. Even short-term contact with human skin lead to a quantifiable and long lasting adsorption of the surfactant.

A **reduction of SLES adsorption** was achieved by the addition of the mild co-surfactant Sodium Cocoyl Glutamate to standard shower formulations. CCG itself did not adsorb onto the skin in relevant amounts. The reduced SLES adsorption correlated with an **increased moisture content** of the skin, with enhanced **mildness** and with an **improved sensory perception** of the formulations.

Hostapon[®] KCG Sodium Cocoyl Glutamate

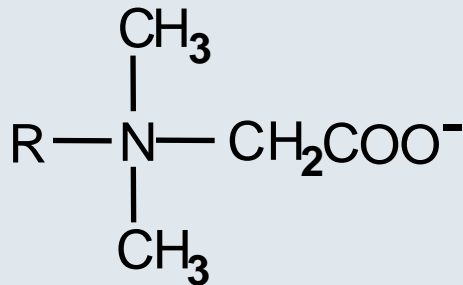
Summary of Properties

- available as low-salt product (Hostapon KCG)
- very mild anionic surfactants based on a natural amino acid and coconut oil
- reduces irritation due to ability to remove SLES from skin
- improvement of foam aesthetics, especially in the range of skin pH
- excellent skin feeling in shower gels
- application in shampoos, shower gel and facial & body cleansers

Genagen[®] KB
Coco-Betaine

Genagen[®] KB

INCI: Coco Betaine



R = Cocoyl residue

Applications

- Shampoos
- Foaming facial cleansers
- Bubble baths
- Mild shower gels
- Liquid soaps of all kinds
- Bath soaps
- Cleansing lotions, cold creams
- Hair dyes, colors

Benefits

- Mild surfactant (cleansing effect)
- Foam boosting
- Hair and skin conditioning effects
- Exceptionally effective viscosity increasing agent (highly responsive to salt)

Genagen[®] KB Coco-betaine

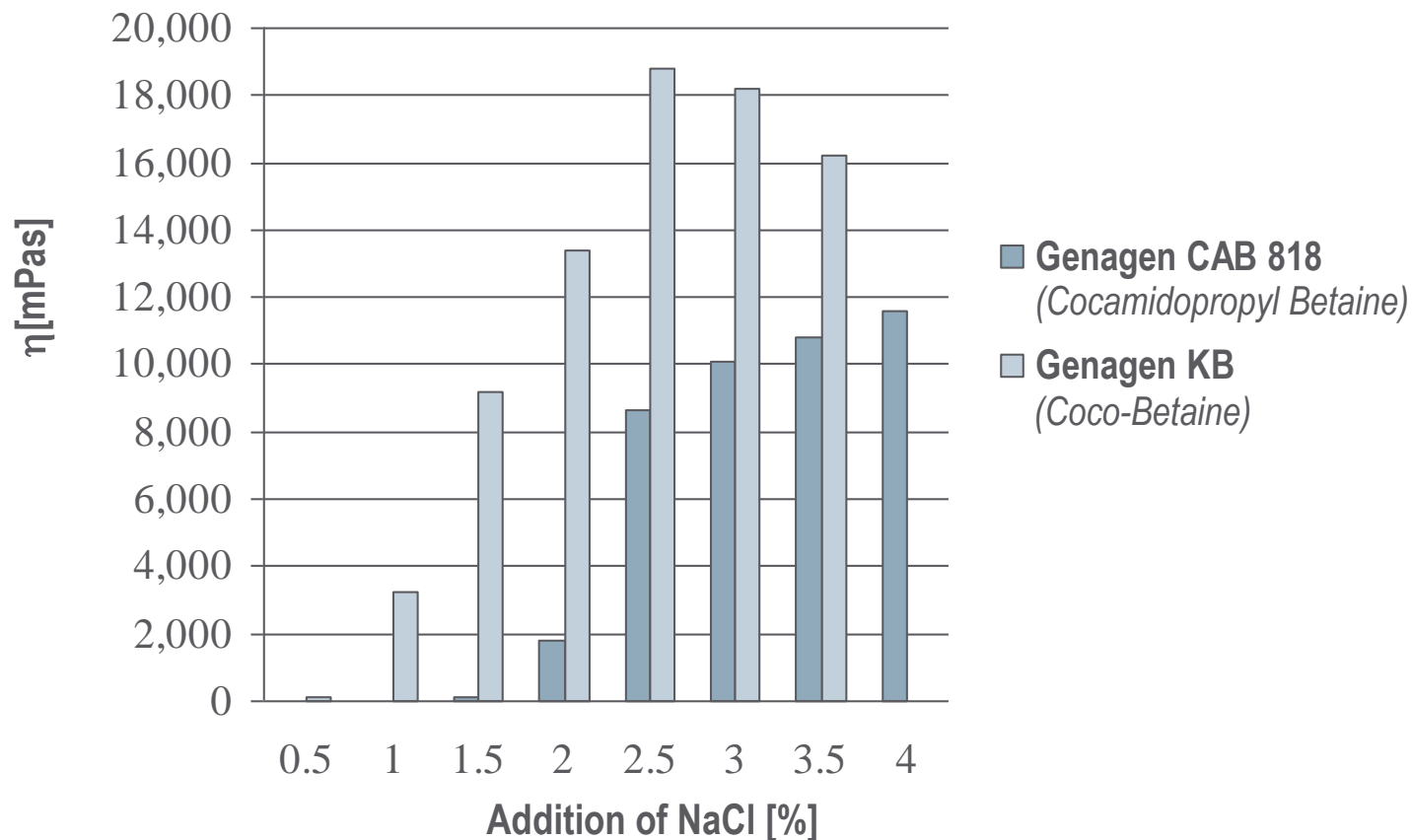
Viscosity building properties

- Genagen KB is a high performance viscosity builder in Ether sulfate based formulations
- Can be used to viscosify ,hard to thicken' systems (e.g. Acylglutamate)
- Using Genagen KB in personal care systems can reduce or eliminate the need for other commercial thickeners (e.g. Cocamide DEA)
- Efficient: Low % amplifies viscosity response. Cheaper and milder formulations possible. Commercial Shampoos show ratio Ether sulfate: Coco-Betaine = 6 : 1

Genagen[®] KB

High Performance Viscosity Builder

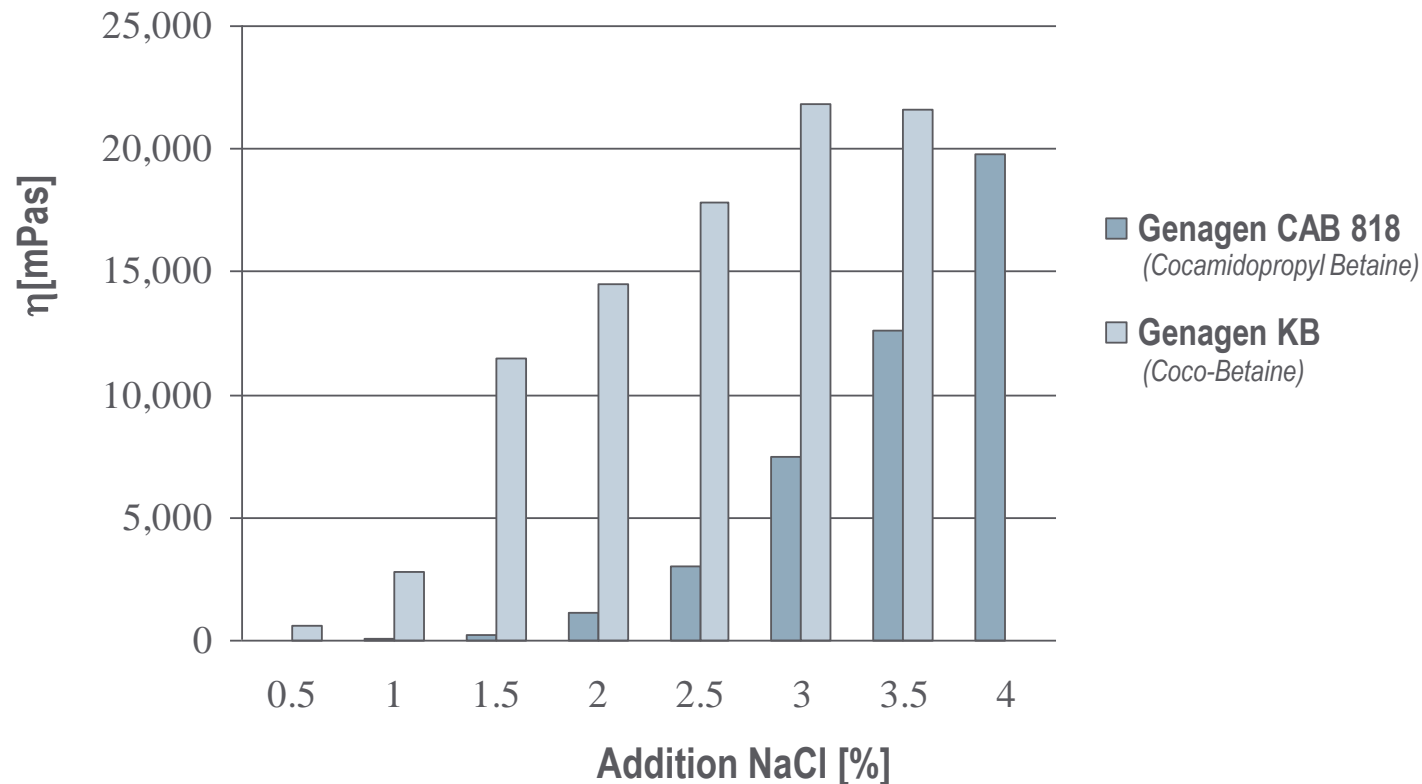
- Comparison Genagen KB, Genagen CAB 818 in presence of Sodium Laureth Sulfate (Ratio 8:2, Total Surfactant Activity: 12%, pH = 5.5)



Genagen[®] KB

High Performance Viscosity Builder

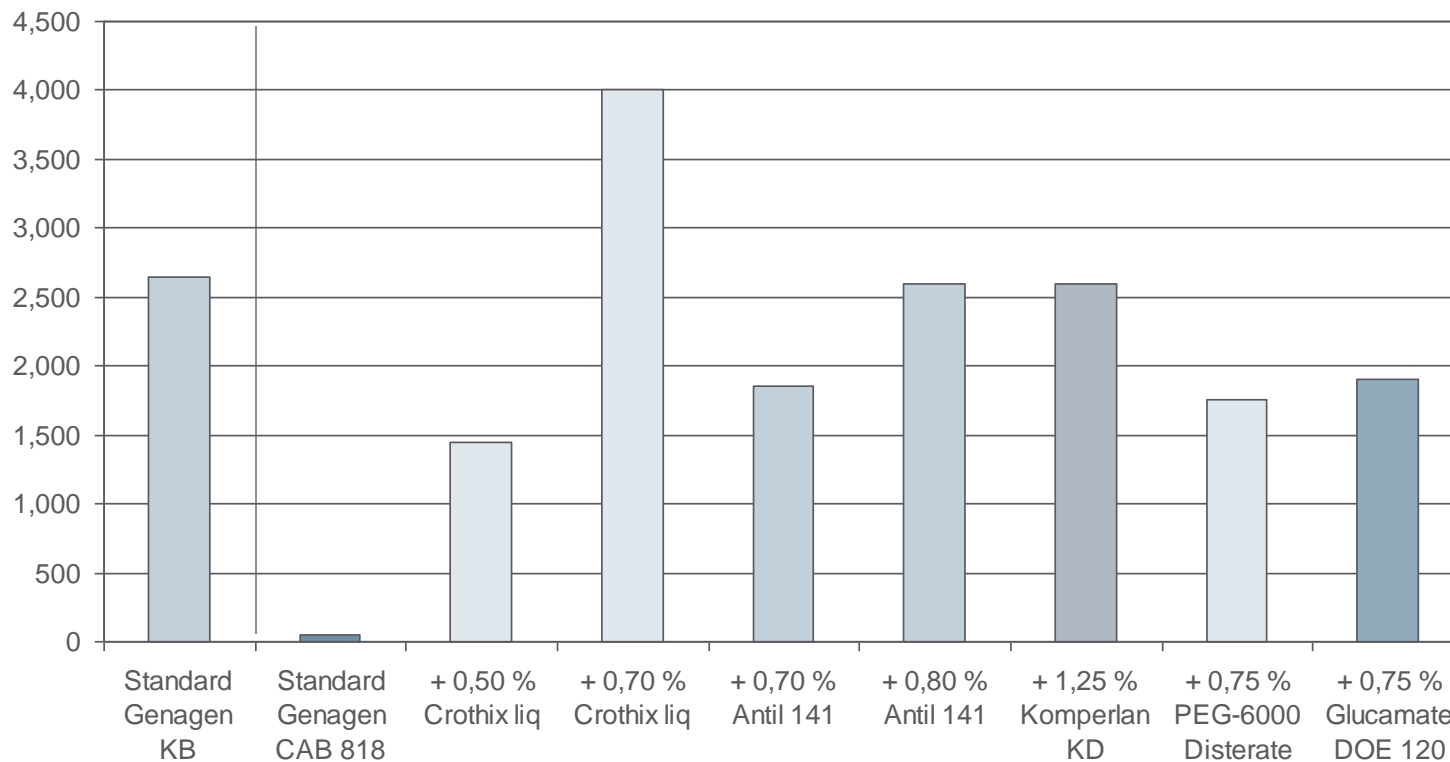
- Comparison Genagen KB, Genagen CAB 818 in presence of Sodium Laureth Sulfate and Hostapon KCG (Sodium Cocoyl Glutamate)
 - Ether sulfate 10 %, Betaine 3 %, Acylglutamate 2 %, pH = 5.5, Total Surfactant Activity: 15%



Genagen[®] KB

High Performance Viscosity Builder

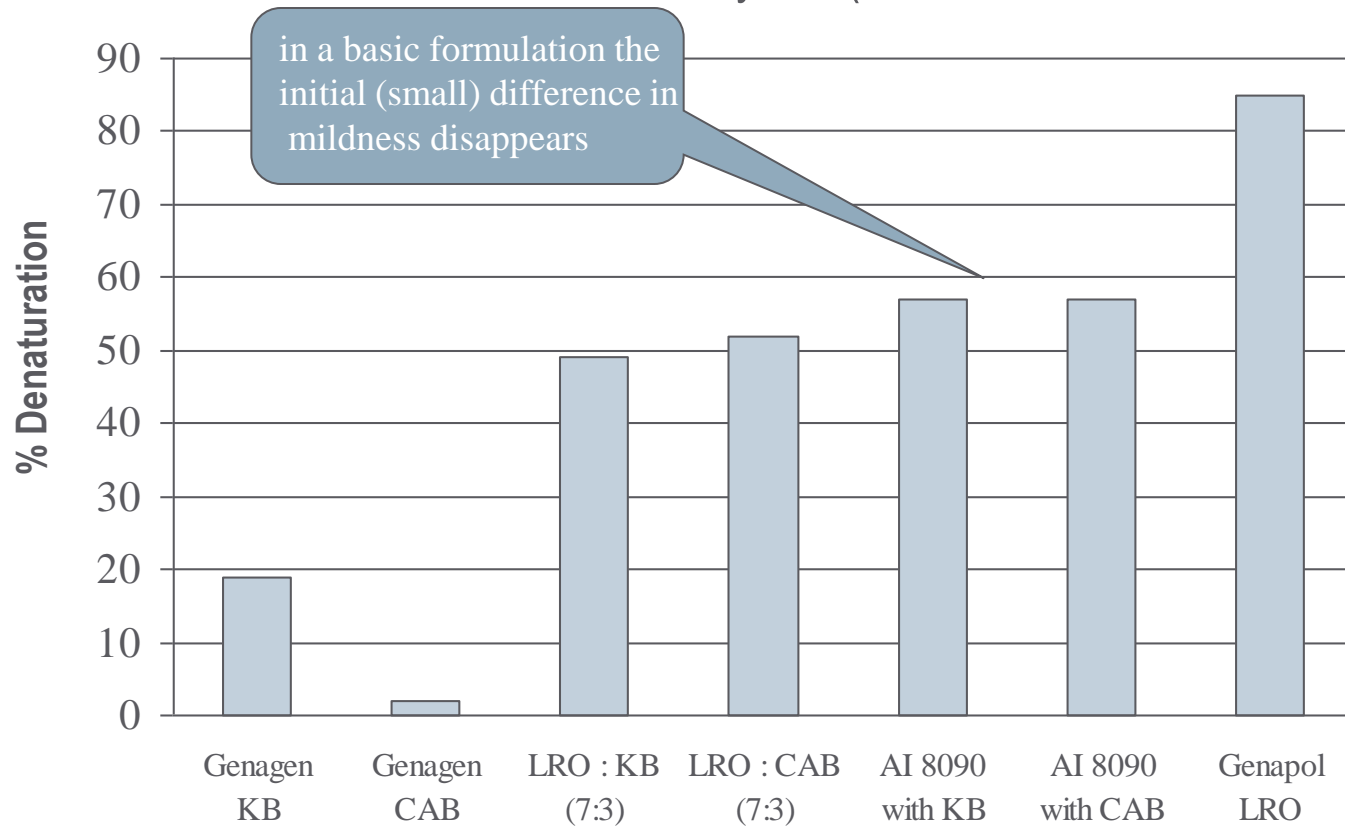
- Comparison Genagen KB, Genagen CAB 818 (plus additional viscosifier) in presence of Sodium Laureth Sulfate and Hostapon KCG (Sodium Cocoyl Glutamate)
 - Ether sulfate 10 %, Betaine 3 %, Acylglutamate 2 %, pH = 5.5, 1% NaCl added to all samples



Genagen[®] KB

Mildness Data

- RBC test: Determination of mildness score of two surfactant mixture: Betaine and SLES (3 : 7), single surfactant Betaine (KB or CAB 818)
 - basic formulation: Betaine, SLES, Ethoxylate (AI 8090)



Genagen[®] KB Coco-betaine

Summary

■ Mildness

- Genagen KB is a very mild surfactant, though not as mild as Cocamidopropyl Betaine Genagen CAB 818
- No mildness difference between Cocoyl-Betaine and Cocamidopropyl Betaine in final formulation

■ Foam

- Genagen KB provides superior foaming performance compared to Genagen CAB 818 (cocamidopropyl betaine)

■ Others

- Preservative-free. Water white clear product
- Compatible with anionic, cationic, amphoteric and nonionic surfactants



Hostapon[®] CT

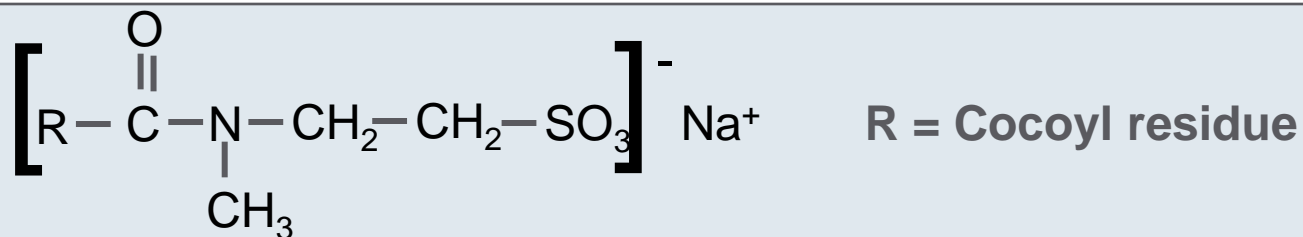
Sodium Methyl Cocoyl Taurate

Hostapon[®] TPHC

Sodium Methyl Oleoyl Taurate

Hostapon[®] CT Paste

INCI: Sodium Methyl Cocoyl Taurate



Applications

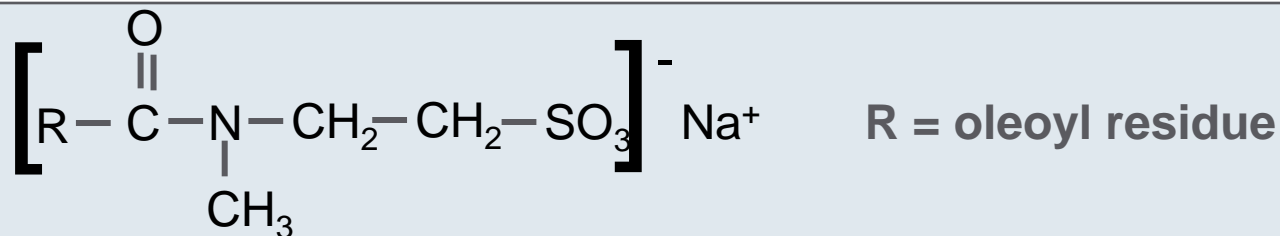
- Liquid soaps of all types
- Facial washes
- Liquid and cream shampoos
- Special bath products in powder/tablet form
- Bubble baths with high foaming
- Syndet bars

Benefits

- High lathering power and foam stabilizing effect
- Provides dense, rich foam and viscosity
- High activity, free of preservatives
- Combines mildness with outstanding foaming properties

Hostapon[®] TPHC

INCI: Sodium Methyl Oleoyl Taurate



Applications

- Special bath products in powder/tablet form
- Bubble baths with high foaming
- Syndet bars
- Foam booster

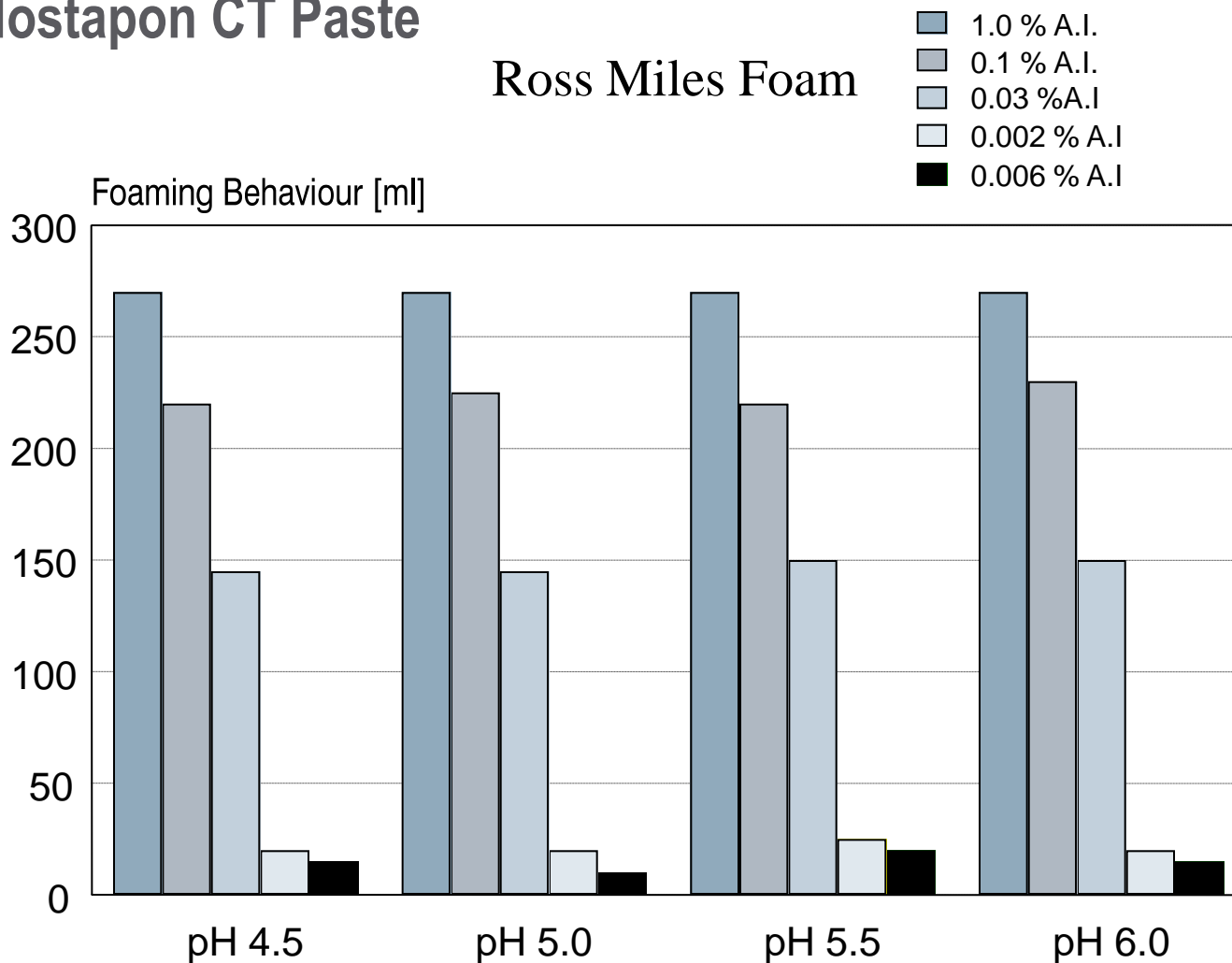
Benefits

- High lathering power and foam stabilizing effect
- Retains foaming capacity in hard water
- Combines mildness with outstanding foaming properties

Foaming behavior of Sodium Cocoyl Methyl Taurate

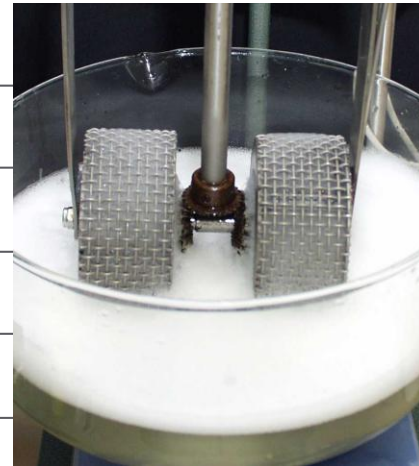
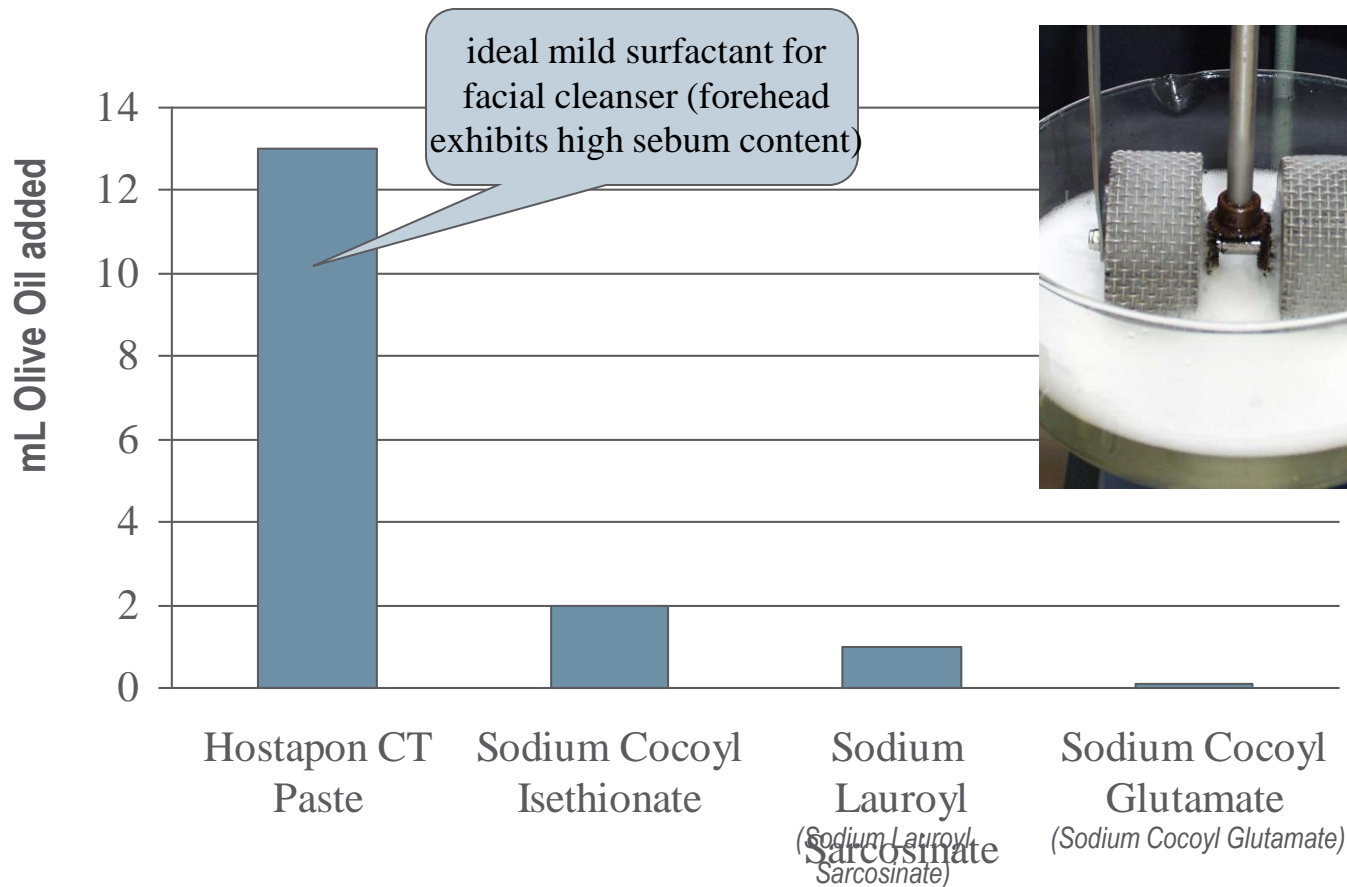
Hostapon CT Paste

Ross Miles Foam



Hostapon CT Paste: foam stability in the presence of oil

**Total Surfactant Activity: 0.05 %, pH = 5.5, tap water (not distilled)
Determination of oil quantity needed to break the foam surface**



Hostapon[®] Taurate Surfactants

Hostapon CT Paste Sodium Methyl Cocoyl Taurate

Hostapon TPHC Sodium Methyl Oleoyl Taurate

- high performance foam enhancers for mild rinse off formulations: Rich, dense foam is provided
- ideal mild surfactant for facial cleanser (forehead exhibits high sebum content), as they stabilize foam in presence of oil
- very effective co-surfactants: Typical use concentration is approx 2 % (active ingredient)
- compatible with all nonionic and anionic surfactants and are stable over a broad pH range
- free of preservatives



Exactly your chemistry.

Genagen[®] 3SB

Genagen[®] 3SB

Three Surfactant Blend

Optimized mild, three surfactant blend for shampoos, bubble baths and shower gels

- Combines the benefits of the single surfactants
 - Coco Betaine (high performance viscosity builder)
 - Sodium Methyl Cocoyl Taurate (great foam in presence of oil)
 - Sodium Cocoyl Isethionate (rich, creamy, “soap-like” lather)
- Low viscous, water clear liquid
- Convenient and easy handling, cold processable
- Typically combined with SLES at ratios of 1:1 to 1:1.5



*Emulsogen[®]
Ether Carboxylate
Surfactants*

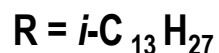
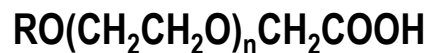
Emulsogen[®] Ether Carboxylates

- Emulsogen[®] ether carboxylates are mild surfactants, ideal for use in a wide range of personal care formulations. From improved solubilization of oils to enhanced cationic deposition, the Emulsogen line of ether carboxylates can make your formulations “EC-er”.

Key Benefits:

- versatile materials, with excellent cost/performance ratios
- Superior mildness
- Compatibility with anionic, cationic, nonionic or amphoteric materials
- Excellent solubilizing and emulsifying properties
- Powerful hydrotropic/coupling ability
- Stability over a broad pH range
- Excellent electrolyte/hard water tolerance

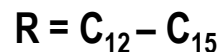
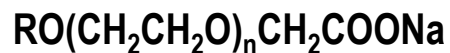
Emulsogen[®] ether carboxylates



$$n = \sim 7$$

Emulsogen DTC Acid

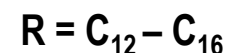
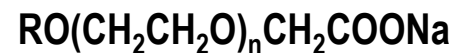
(90% active)



$$n = \sim 12$$

Emulsogen LS24 Gel

(70% active)



$$n = \sim 12$$

Emulsogen LS24 N

(70% active)

■ Typical properties

	Emulsogen [®] DTC Acid (INCI: <i>Trideceth-7 Carboxylic Acid</i>)	Emulsogen [®] LS-24N (INCI: <i>Sodium Laureth-13 Carboxylate</i>)
Physical Form (25°C)	Liquid	Gel
Appearance	Pale yellow, low viscosity liquid	Clear to slightly hazy, colorless gel
Activity	~90%	~70%
pH	~3.5	~7.5
Water	~8%	~30
NaCl	<1%	~2%

Emulsogen[®] Ether Carboxylates

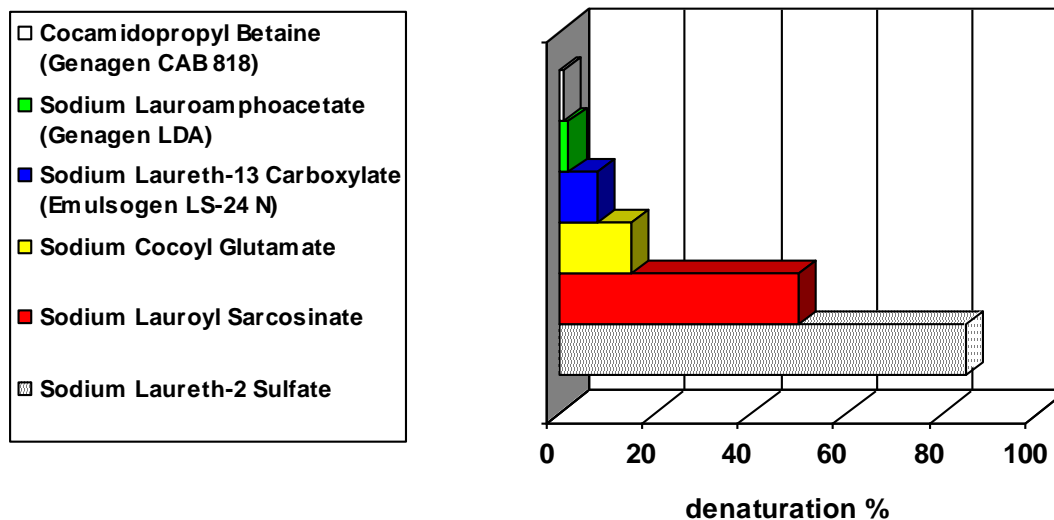
Summary of Applications

Emulsogen LS-24N <i>INCI: Sodium Laureth-13 Carboxylate</i>	Emulsogen DTC Acid <i>INCI: Trideceth-7 Carboxylic Acid</i>
Mild surfactant for liquid foaming formulations	Mild, easy-to-handle liquid surfactant for use in liquid foaming formulations
Improves deposition of cationic materials out of surfactant systems	Improves deposition of cationic materials out of surfactant systems
Gellant for transparent/translucent fragrance or deodorant sticks	Solubilizer for silicones, other oils in clear formulations.
Hydrotrope for formulation compatibilization	Acidic, perfect for use in neutralizing shampoos

Emulsogen[®] ether carboxylates

outstanding mildness

- Not only are ether carboxylates inherently mild, but they can also contribute to the mildness of formulations by mitigating the effects of more irritating surfactants such as sodium dodecyl sulfate
- Ether carboxylates are suitable for all types of foaming products for sensitive skin, including baby washes/shampoos, and facial washes



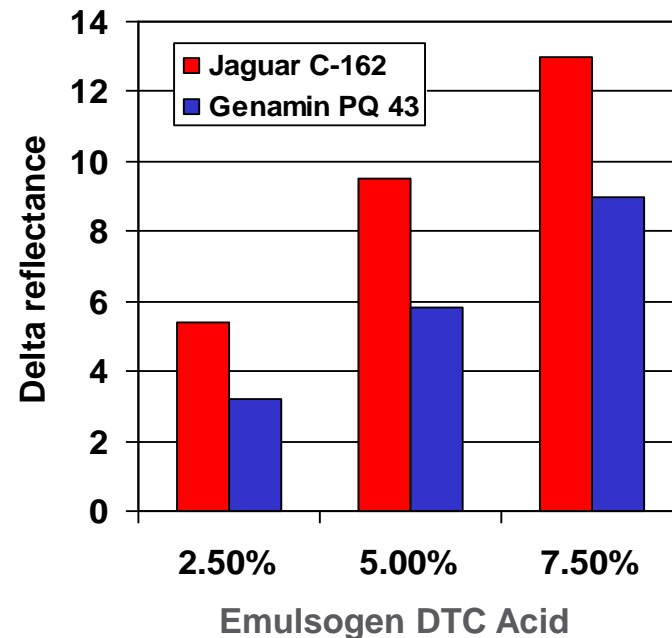
Comparative mildness of various co-surfactants, using the “red blood cell test”: a colorimetric test that correlates surfactant mildness to lack of disruption of the red blood cell membranes. A lower number equates to a milder surfactant.

Improved Cationic Polymer Deposition with Emulsogen[®] DTC Acid

- Emulsogen[®] ether carboxylates have been shown to increase the deposition of cationic polymers out of surfactant systems

Cationic deposition measured using the dye test method: increase in the delta reflectance shows increased deposition of the cationic polymer on the substrate.

The change in reflectance was measured versus a control containing 20% Sodium Laureth Sulfate (SLES), 24% total surfactant.



- A portion of the SLES was replaced with Emulsogen DTC Acid, to maintain the same total surfactant concentration.
- Substituting even small amounts of the Emulsogen DTC acid for SLES showed a significant increase in the deposition of the cationic on the substrate.

Emulsogen[®] Ether Carboxylates

Suggested Use Levels:

- Co-surfactant for liquid soaps, shampoos, shower gels: 3-12%
- Hydrotrope/solubilizer: 2-5%

Compatibility:

- Emulsogen[®] ether carboxylates are anionic surfactants, but are compatible with cationics, as well as most other materials typically used in personal care formulations (anionic, nonionic and amphoteric surfactants, as well as polymeric cationic conditioners, monomeric quats, etc.)
- Emulsogen ether carboxylates are stable under a wide pH range (2.0-10)
- Optimal foaming properties are obtained when the products are at least partially neutralized (pH>5)

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Questions?

 **Clariant**

Exactly your chemistry.

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Thank you



Exactly your chemistry.

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