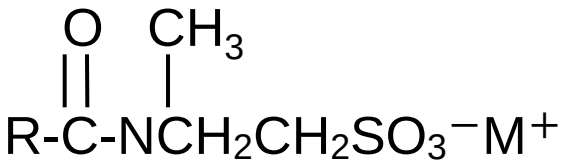
DIAPON® series

NOF CORPORATION
Oleo & Speciality Chemicals Div.

1 Feature

"DIAPON® series" are amino acid-based surfactants consisted of sodium acyl methyl taurate. They provide a moisturizing feeling and an excellent foaming property in wide pH range. DIAPON® series are the mild washing surfactants that show low irritation for skin and hair.



R:Alkyl group
M:Counterion

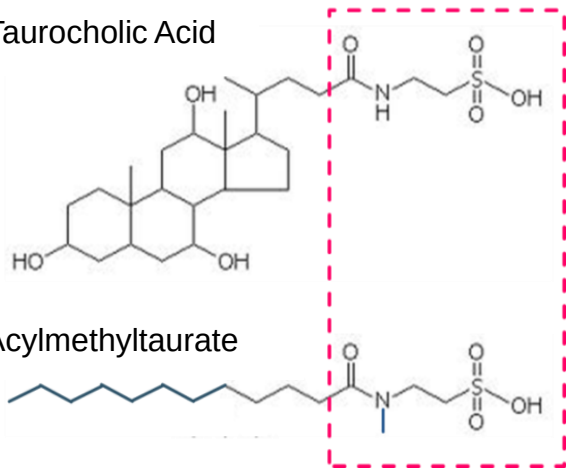
DIAPON® series			INCI Name
Product name	R−(C=O)	M	
DIAPON®K-SF	Cocoyl	Na	SODIUM METHYL COCOYL TAURATE
DIAPON®HF-SF	Caproyl	Na	SODIUM METHYL CAPROYL TAURATE
DIAPON®K-SG	Cocoyl	$H_3N(CH_2)_2SO_3Na$	SODIUM TAURINE COCOYL METHYLTAURATE

- **Plant-derived surfactants having similar chemical structure to biological materials.**
  They are amino acid based surfactants similar to biological material, therefore they have natural image.
- **Excellent foam ability in wide pH range**
  DIAPON® series show high foam ability and foam stability, and make rich foam in wide pH range.
- **Sebum-selective cleansing ability**
  DIAPON® series can wash out stain on skin, but don't wash out necessary biological lipid for us.
- **Low irritation**
  DIAPON® series are the mild surfactants that show low remaining property on skin and low irritation for eyes. Especially, DIAPON® HF-SF remarkably show low irritation for eyes.

2 Functionality

Similar structure to biological material

Taurocholic Acid

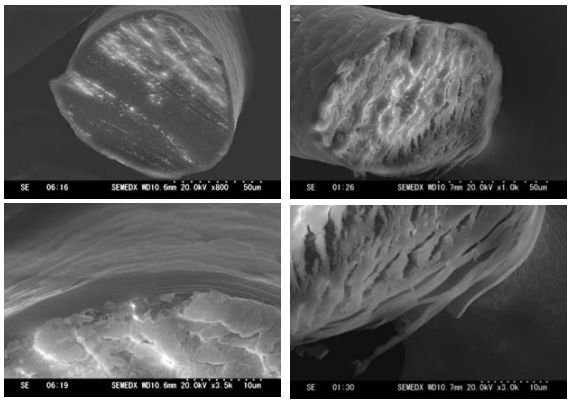


Acylmethyltaurate

DIAPON® has natural image because of similarity to biological material (taurocholic acid).

Influence of surfactants on hair

DIAPON® K-SF　　Sodium Laureth Sulfate



Concentration of surfactants solution　:100mM
Processing condition by ultrasonic wave
:25～35℃, 3h, 47kHz 150W

The surface of hair treated with DIAPON® K-SF shows resistance to damages.

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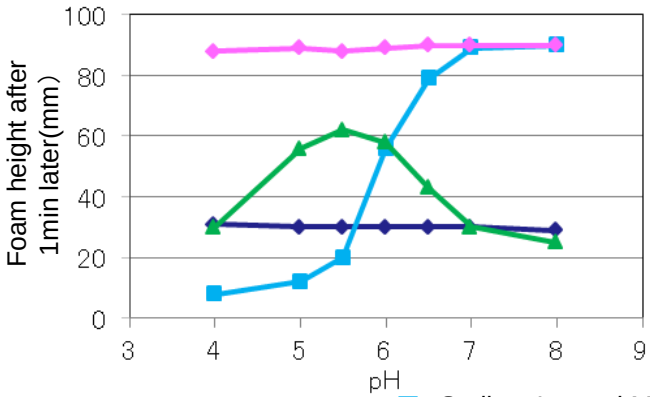
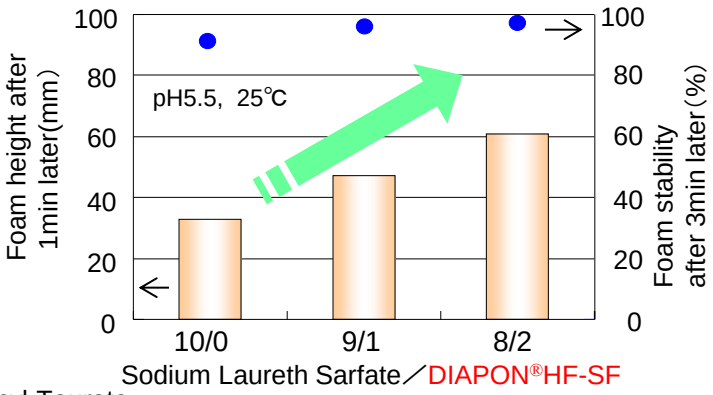
2 Functionality

Forming ability

Excellent foaming ability in wide pH range



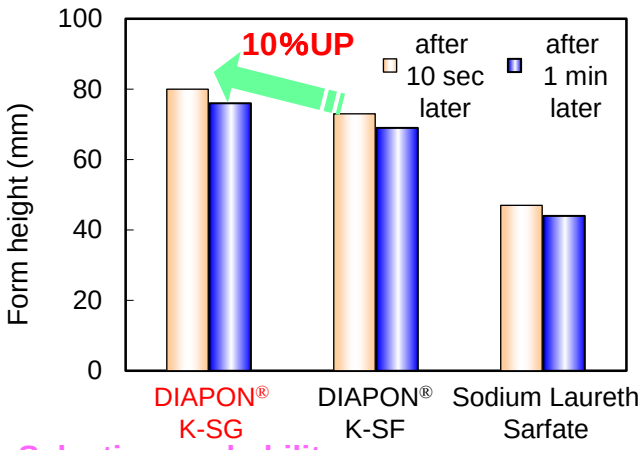
Foam increasing effect of DIAPON® HF-SF



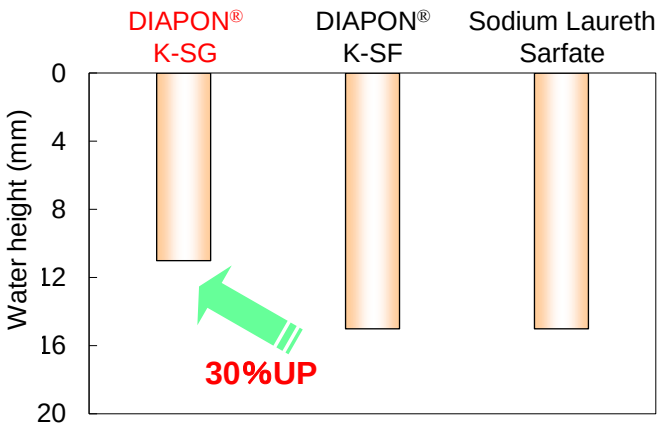
◆ DIAPON® K-SF
▲ Sodium Cocoyl Glutamic Acid
■ Sodium Lauroyl Methyl Taurate
■ Sodium Laureth Sarfate

Measurement condition
Method：①1wt% surfactant water solution was stirred 5 seconds by mill mixer.
②After later after stirring, foam height was measured.

Forming ability of DIAPON® K-SG

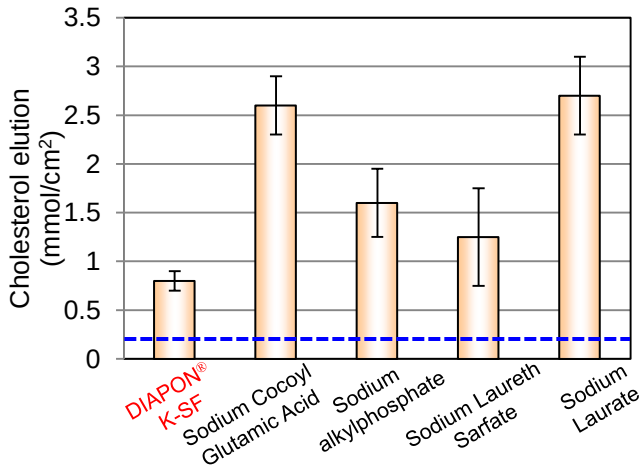


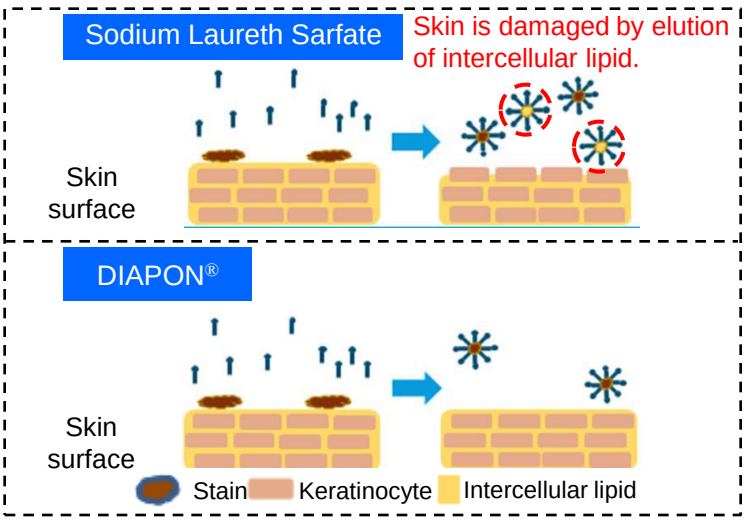
Foam stability of DIAPON® K-SG



Selective washability

Elution test of cholesterol





Measurement condition
Sample：Skin of human breast　Condition：25mM surfactants, 10min
Method：After tape stripping, measuring cholesterol with HPLC.
※Broken line shows the sample treated with water only.

Moisture-retaining effect of taurine provide moisture feeling to hair.

Reference：Japan Oil Chemists Society. 38(4), 297-305, 1989 "Anionic Surfactants as Detergents for Scalp and Hair"

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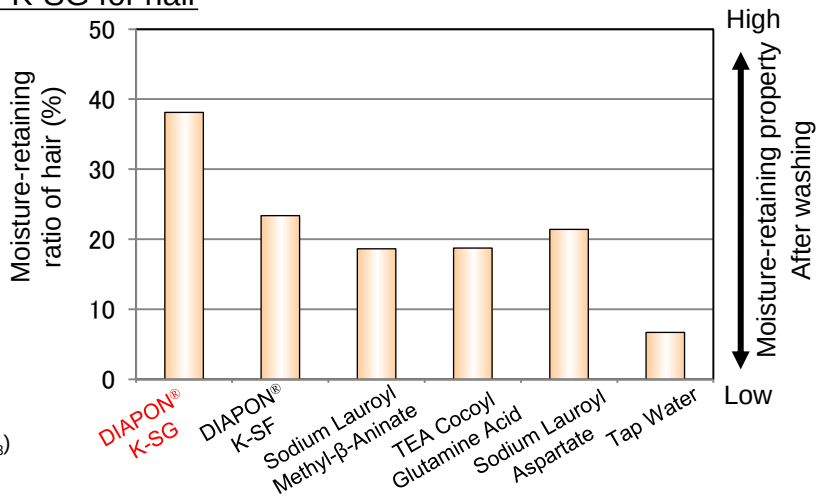
2 Functionality

Moisture-retaining property

Moisture-retaining property of DIAPON®K-SG for hair

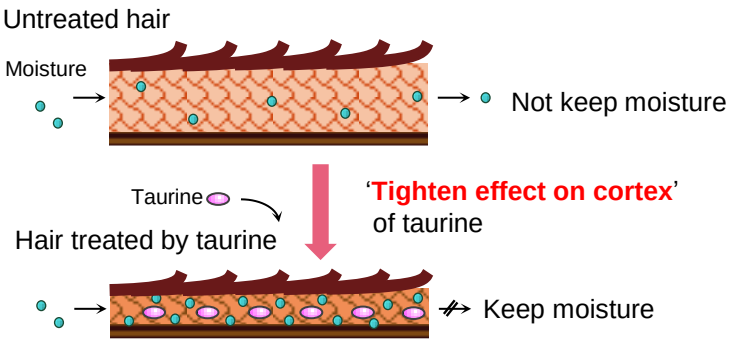
Halogen moisture meter (Mettler-Toledo)



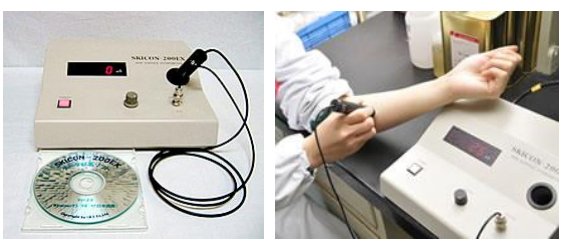
Measurement condition

Method：①Wash damaged hair by 1wt active% surfactant solution in artificial hard water(100 ppm of $CaCO_3$) for 15 minutes at 25℃.
②Rinse off hair sample by enough amount of water.
③Dry the hair sample at the constant temperature and humidity room.
④Measure at 60℃, 105℃ with moisture analyzer.

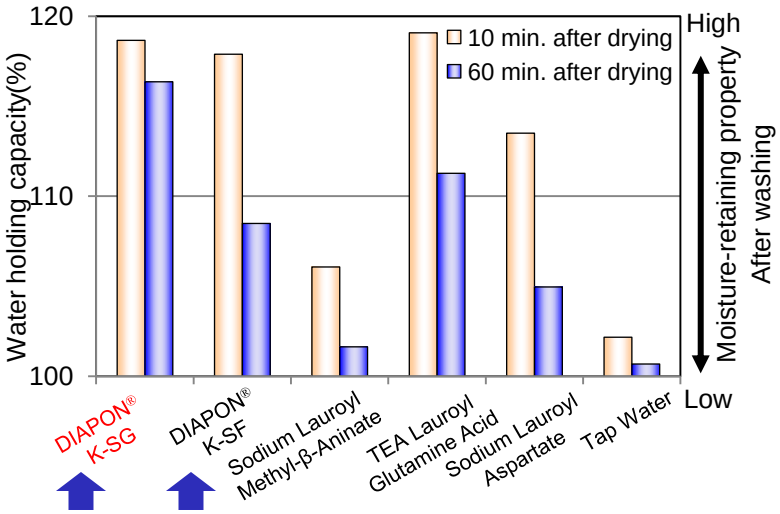
$$\text{Moisture-retaining ratio of hair(\%)} = \frac{\text{Remaining amount of water content in blowing hair (Remaining amount of water evaporation at 60℃)}}{\text{Total water content in hair (Amount of water evaporation at 105℃)}} \times 100$$



Moisture-retaining property of DIAPON®K-SG for skin



＜Skicon 200EX＞



Measurement condition

Method：①Skin was rinsed with water.
②Acclimated in the room (20℃,40％RH) for 30min.
③EC of skin was measured.
④1wt% of surfactant aq. was applied onto skin.
⑤After 30min, skin was rinsed with water, and dried. People were acclimated in the room (20℃,40％RH) for 30min.
⑥EC of skin was measured (10 and 60 min).

$$\text{Water holding capacity(\%)} = \frac{\text{Electrical conductivity after treating by surfactant}}{\text{Electrical conductivity before treating by surfactant}} \times 100$$

High moisture-retaining property for skin even after dry.

DIAPON® K−SG is suitable for Scalp-care concept.

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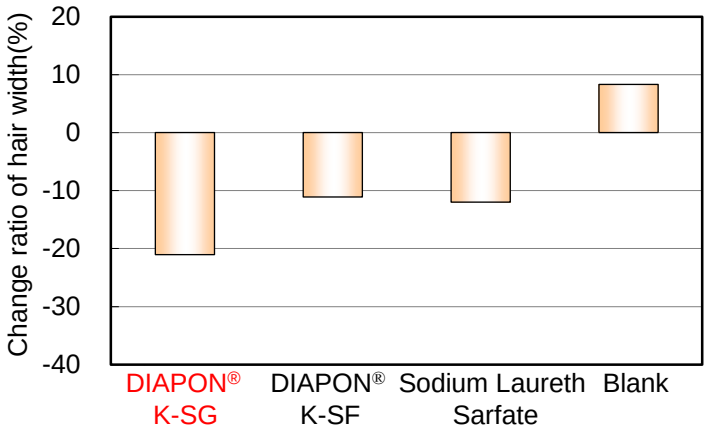
2 Functionality

Suppression effect of hair fly



Measurement condition

Method:①Wash damaged hair by 1wt active% surfactant solution in artificial hard water(100 ppm of $CaCO_3$) for 15 minutes at 5℃(Blank means treatment with water).
②Rrinse off hair sample by enough amount of water.
③Dry the hair sample at the constant temperature and humidity room.
④Comb hair at 5 times.
⑤Measure the hair width on the 5cm from bottom of the hair.

DIAPON® K-SG suppresses a dry feeling and a starchy feeling and gives cohesiveness to the hair.

Low-temperature stability

Ingredients	Active component（wt%）
Sodium Taurine Cocoyl Methyltaurate	**9.0**
Cocamidopropyl Betaine	6.0
Lauramide DEA	2.0
Cationized polymer	0.5
Citric Acid	Moderate amount
Water	Balance
pH（neat liquid）	5.8

Cationized polymer	DIAPON® K-SG
PQ-10	Clear
PQ-22	Clear
PQ-7	Clear
PQ-39	Clear
PQ-47	Clear

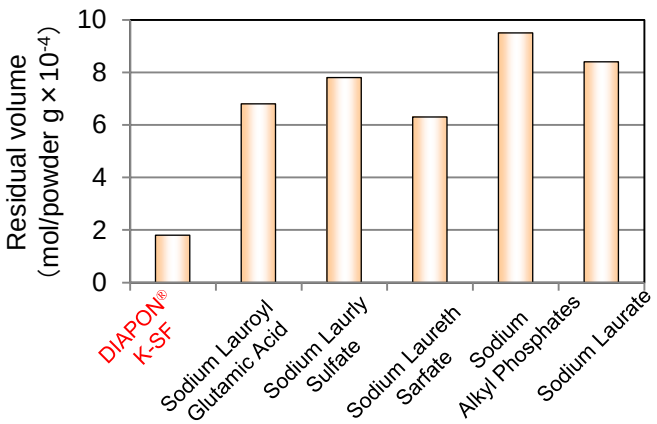
Appearance of shampoo

Highly blending DIAPON® K-SG
Using PQ-10
At －5℃ after 1 week

Clear shampoo is obtained by highly blending DIAPON® K-SG and various cationized polymer as content of sodium chloride decrease.

3 Safety

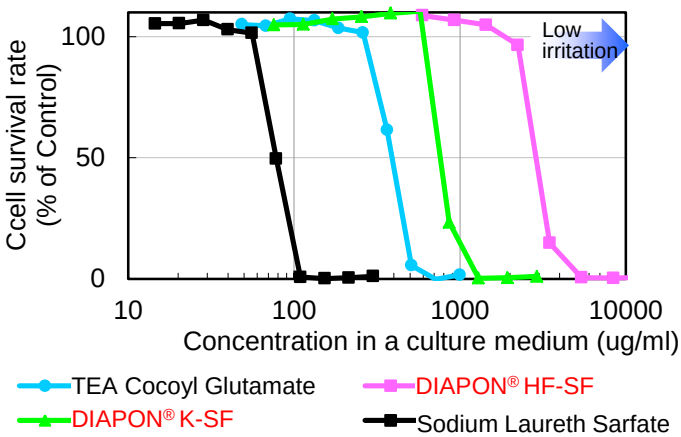
Residual test using similar material to skin



Measurement condition
Sample：Hide powder（skin analogue material）
Method：①Processing：50mM surfactant, 40℃, Incubate 5 hours.
②After tape stripping, measuring with HPLC.

Reference：Japan Oil Chemists Society. 38(4), 297-305, 1989 "Anionic Surfactants as Detergents for Scalp and Hair"

Eye irritation test（NR Bio Assay）



Measurement condition
Method：①Adding surfactant aq with various concentration to corneal cell of rabbit.
②NR was extracted 48 hoers later, and measured absorbance at 540nm.

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