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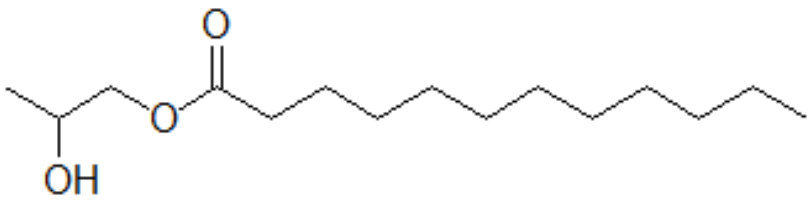
NOF CORPORATION

Cleansing performance improver

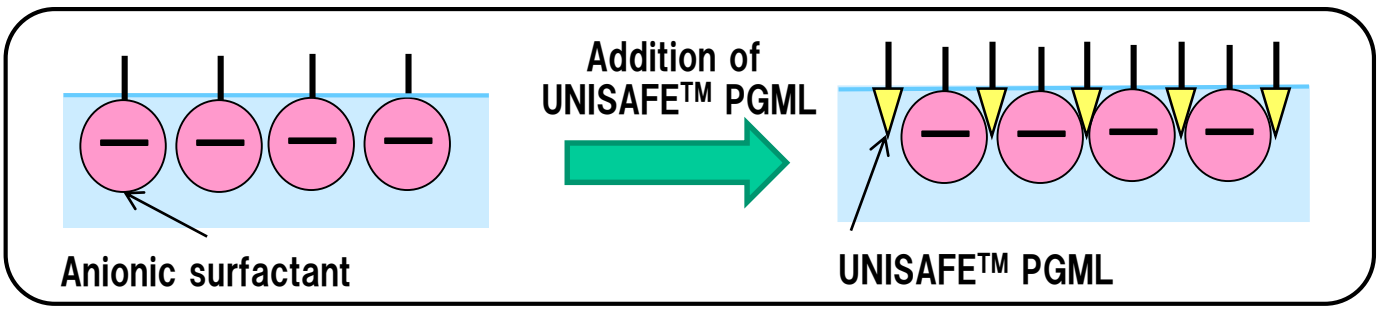
UNISAFE™ PGML

1 What is UNISAFE™ PGML?

「UNISAFE™ PGML」is a monoester of Lauric acid and Propylene glycol.

Structure	
Concept	*Cleansing performance improver*
INCI	PROPYLENE GLYCOL LAURATE
Chinese INCI	丙二醇月桂酸酯
Appearance	Colorless to pale yellow liquid at 25℃

2 Concept



High packing property

- thickening efficacy
- Improve foam quality
- Improve detergency

3 Characteristics

① High thickening effect

② Improve detergency by increasing the packing of surfactants

③ Smooth/Sleek texture during rinsing

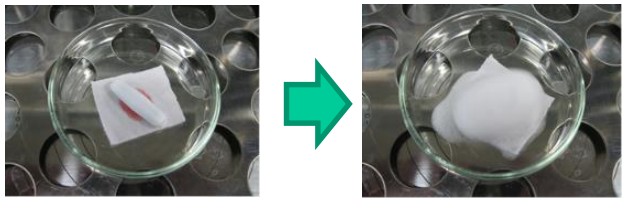
④ Easy to use because of liquid appearance

⑤ Compliant with JSQI and available in China

4 Improvement of detergency

<method>

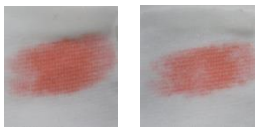
① 20μL of colored model sebum was attached in 2 × 2cm of cloth (cotton).
② Put a dish containing the cloth on the stirrer. Put a stirrer chip on the cloth.
③ Put out a push amount of foam from the pump foamer and rotate for one minute.
④ Washed with pooled water for 30 seconds and dried.
⑤ Measure red light strength and calculate washing rate by the following equation.

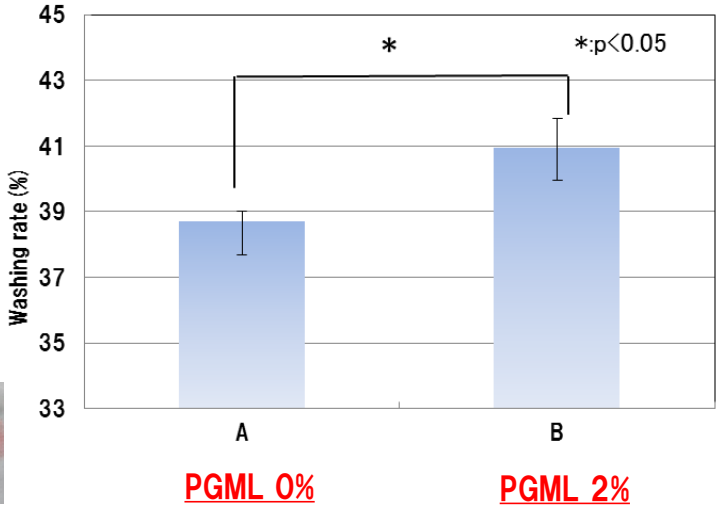


Washing rate (%) = $(1 - a/a_0) \times 100$
a_0: Red light strength before washing off
a: Red light strength after washing off

<Result>

INCI	A	B
SODIUM LAURETH SULFATE	10.5	8.5
PROPYLENE GLYCOL LAURATE	-	2
WATER	91.5	91.5
surface tension (mN/m)	33.2	26.7





Addition of UNISAFE™ PGML ⇒ Improve detergency by reducing surface tension

5 Thickening effect

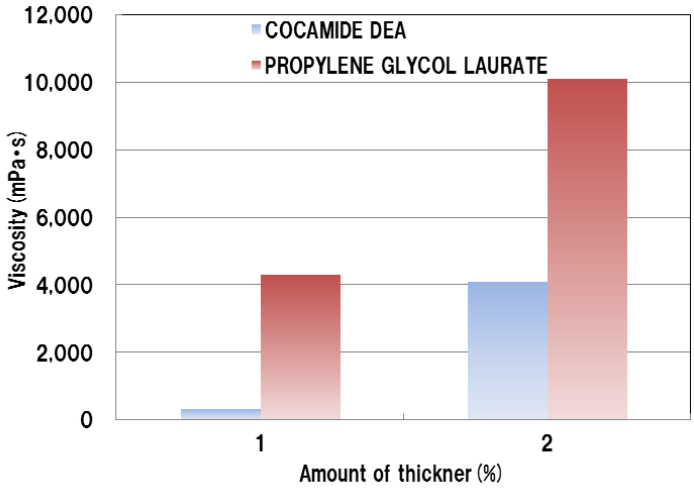
High thickening effect than Cocamide DEA

＜Condition＞

SODIUM LAURETH SULFATE ・・・ 7.5wt%
COCAMIDEPROPYL BETAINE ・・・ 7.5wt%
COCAMIDE DEA or
PROPYLENE GLYCOL LAURATE・・・ 1wt%、2wt%

pH:5.5 (25℃),

Viscosity:E typeViscometer (mPa・s, 25℃)



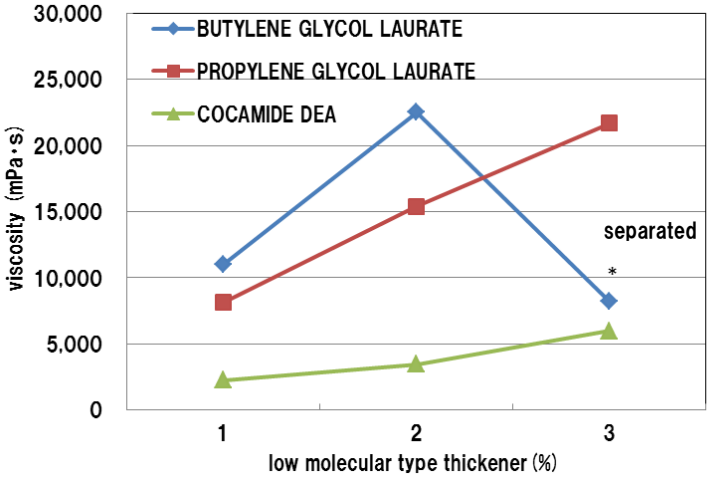
Thickening Amino acid-based surfactant by the combination of Monocarboxylic acid type anion, polyether thickener and this product.

＜Condition＞

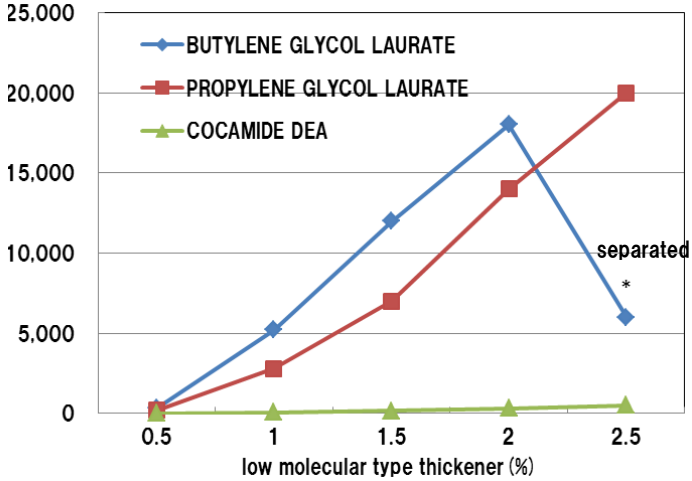
Anionic surfactant	:SODIUM METHYL COCOYL TAURATE (AMT) or TEA-COCOYL GLUTAMATE (AGS)	・・・ 7.8wt%
Ampholytic surfactant	:COCAMIDOPROPYL BETAINE	・・・ 7.8wt%
Monocarboxylic acid type anion	:SODIUM LAUROY METHYLAMINOPROPIONATE	・・・ 3.9wt%
Low molecular type thickener	:COCAMIDE DEA or BUTYLENE GLYCOL LAURATE or PROPYLENE GLYCOL LAURATE	・・・ 1～3wt%
Polyeter type thickener	:PEG-120 METHYL GLUCOSE TRIISOSTEARATE (75%)	・・・ 1.0wt%

pH:5.5 @Citric acid

SODIUM METHYL COCOYL TAURATE



TEA-COCOYL GLUTAMATE



6 Formulation guide

Silicone free Shampoo

NOF Product	INCI	wt%
DIAPON® K-SF	SODIUM METHYL COCOYL TAURATE (30%aq.)	20.0
-	SODIUM COCOYL GLUTAMATE (25%aq.)	12.0
NISSAN ANON® BDF-R	COCAMIDEPROPYL BETAINE (30%aq.)	12.0
SOFTILT® AS-L	SODIUM LAUROY METHYLAMINOPROPIONATE (30%aq.)	18.0
UNISAFE™ PGML	PROPYLENE GLYCOL LAURATE	2.0
MACBIOBRIDE® MG-T	PEG-120 METHYL GLUCOSE TRIISOSTEALATE (75%aq.)	1.0
-	POLYQUATERNIUM-10	0.5
-	Preservatives, pH adjuster	q.s.
-	WATER	balance

pH:5.5　Viscosity:3300 mPa・s (25℃)

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