General Surfactants

Surfamide 81 DIPA

Cocamide DIPA 2:1 Modified

Overview

- 100% active 2:1 Kritchevsky detergent grade coconut based diisopropanolamide surfactant
- Mild, naturally derived, readily biodegradable and DEA-free
- Exceptional solubility in alcohols and glycols, and aromatic and chlorinated hydrocarbons
- Water dispersible lubricant and antistat for use in textile fiber spinning, cutting fluids and conveyor belt lubricants
- Use in water-based cleaning formulations along with anionic surfactants for enhanced foam control and viscosity response

Regulatory

The substances in Surfamide 81 DIPA are listed on and in compliance with the following Inventories: US (TSCA), Canada (DSL), Mexico (INSQ), Europe (EINECS: 271-657-0), Australia (AICS), China (IECSC), Japan (ENCS: 8-311), Korea (ECL: KE-14301), New Zealand (NZIoC), Philippines (PICCS)

CAS#68855-69-6

Technical Information

Surfamide 81 DIPA is a 2:1 coconut based diisopropanolamide surfactant. Effective as a foam booster and stabilizer, fragrance and essential oil solubilizer, and viscosity builder in liquid detergent formulations, Surfamide 81 DIPA is a versatile ingredient.

Surfamide 81 DIPA is a 100% active, naturally plant derived surfactant with high biodegradability and low aquatic toxicity. The exceptional quality and low color profile of Surfamide 81 DIPA allows for use in a wide range of markets and applications.

Formulary

Surfamide 81 DIPA is a 2:1 Kritchevsky modified detergent grade alkanolamide characterized by solubility in alcohols and glycols, and aromatic and chlorinated hydrocarbons, "back-titrated" with a range of acids for optimized performance.

Surfamide 81 DIPA is an effective degreasing emulsifier and corrosion preventing lubricant used in metal cleaning and finishing processes. Use Surfamide 81 DIPA in textile applications as an ingredient for scouring, dye-leveling and sizing applications.

Surfamide 81 DIPA is used as an antistatic agent in plastics, e.g. in polyethylene film for food packaging and rigid poly(vinyl) chloride, and used in combination with metallic salts as an antistatic for polystyrene and in impact-resistant rubber polystyrene blends.

Typical Properties

PROPERTY	VALUE
Appearance	Viscous amber liquid
Odor	Mild
Ionic character	Nonionic
Water solubility	Soluble
Activity, %	100
Free amine, %	18-22
pH (1% aq.)	9.0±1.0
Density@25°C	0.99±0.04 g/ml
Flash point, °F	>200
RVOC, EPA, %	0
Storage	Freeze/thaw stable
Shelf life	2 years

Packaging and Handling

Surfamide 81 DIPA is available in:
Totes (Net Wt. 2200 lbs)
Drums (Net Wt. 450 lbs)

Refer to Safety Data Sheet (SDS) for information on the safe use, handling, and disposal of this product.

DOT Classification: Non-Regulated

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Alkanolamides are versatile ingredients that find application as foam boosters and stabilizers, and as viscosity builders in liquid detergent formulations ranging from liquid dishwashing liquids to liquid laundry. Alkanolamides are economical ingredients in HI&I cleaning formulations, textile scouting, dye-leveling and sizing ingredients, and in lubricants as corrosion inhibitors.

Commercial alkanolamides are produced through a condensation reaction between fatty acids or fatty esters with an alkanolamine as characterized by monoethanolamine (MEA, diethanolamine (DEA) and diisopropanolamine (DIPA).

The generalized amide formation reaction from primary alkanolamines is illustrated below between 1 mole of fatty acid and 1 mole of MEA, resulting in a 1:1 monoethanolamide and water:

$$RCOOH + H2NCH2CH2OH \rightarrow RCONHCH2CH2OH + H2O$$

To minimize competing reactions resulting in by-products such as amine soap, amino esters and ester amides, monoethanolamides are more typically made from fatty esters, either fatty acid methyl esters or fatty triglycerides. The methyl ester reaction is illustrated below resulting in a 1:1 monoethanolamide and methanol:

$$RCOOCH3 + H2NCH2CH2OH \rightarrow RCONHCH2CH2OH + CH3OH\uparrow$$

The related reaction substituting the methyl ester with a fatty triglyceride, reacting with 3 moles of MEA results in 3 moles of 1:1 monoethanolamide with 1 mole of glycerin. In this example, glycerin typically remains in the product, where methanol is typically removed via vacuum stripping when made from the methyl ester. Residual glycerin from the fatty triglyceride reaction may yield beneficial properties such as humectancy and lubricity, where the methyl ester reaction yields higher amide actives after vacuum stripping methanol, but at the possible expense of unwanted odor. Monoethanolamides are characterized by limited water solubility and likely to be a solid at room temperature.

Secondary amine dialkanolamides are produced through a condensation reaction similar to that of monoalkanolamides characterized by limited water solubility but likely to be a liquid at room temperature. The generalized amide formation reaction from secondary alkanolamines is illustrated below between 1 mole of fatty acid and 1 mole of DEA, resulting in a 1:1 diethanolamide and water, and similar to monoalkanolamides, can be prepared from the either fatty acid methyl esters or fatty triglycerides. Diethanolamides produced from methyl esters are typically referred to as “super amides” due to their high amide content:

$$RCOOH + HN(CH2CH2OH)2 \rightarrow RCON(CH2CH2OH)2 + H2O$$

$$RCOOCH3 + HN(CH2CH2OH)2 \rightarrow RCON(CH2CH2OH)2 + CH3OH\uparrow$$

Original work involving dialkanolamides is generally credited to Wolf Kritchevsky (US Patent 2089212 issued 1937), where fatty dialkanolamides where produced in both a 1:1 ratio of fatty acid, either through fatty acid or ester, and 2:1 ratio indicating a 2:1 molar excess of amine to fatty acid. The 2:1 fatty alkanolamides, or Kritchevsky amides, are characterized as liquid, water soluble products made up of a mixture of amide, amino ester, free amine, amine soap, amide ester and water, differing in performance and physical properties from a simple blend of a 1:1 amide with added alkanolamine. The 2:1 alkanolamides when back titrated with fatty acids of same or varied composition to the amide are referred to as “modified” 2:1 amides, and can be tailored to a very wide range of applications.

General Surfactants produces and has the ability to produce 1:1, 2:1 and modified 2:1 amides for nearly any application, utilizing a range of alkanolamines, fatty acids, fatty triglycerides and fatty acid methyl ester blends that include:

Surfamide M1	1:1 Cocamide DEA
Surfamide 8	2:1 Cocamide DEA
Surfamide 8	2:1 Modified Coco Diethanolamide
Surfonate 100	2:1 Modified Detergent Alkanolamide
Surfamide MIPA	1:1 Cocamide MIPA Superamide
Surfamide DIPA	1:1 Cocamide DIPA
Surfamide 8 DIPA	2:1 Cocamide DIPA
Surfamide 81 DIPA	2:1 Modified Cocamide DIPA
Surfonate 100 DIPA	2:1 Modified Detergent Alkanolamide