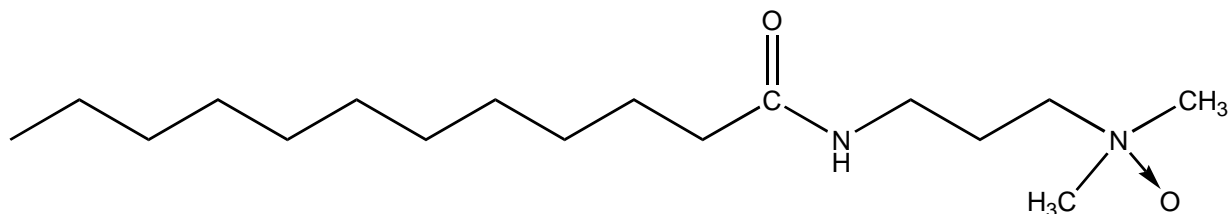


Macat[®] Ultra CDO



Cocamidopropylamine Oxide

Overview

MACAT ULTRA CDO is a 30% active coco (C₁₂) amidopropyl dimethylamine oxide in water. ULTRA CDO is an effective wetting agent, outstanding foam booster, grease cutter and low pH thickener.

The exceptional quality of MACAT ULTRA CDO allows for use in a wide range of markets and applications. In **Personal Care**, ULTRA CDO is based on the renewable vegetable lipid found in coconut oil, making it a uniquely natural compliment for use in hair shampoos, conditioners and rinses as a conditioning agent/surfactant.

MACAT ULTRA CDO is biodegradable, and contains no solvents or VOCs. ULTRA CDO is an efficient lipid solubilizer with an LD₅₀ (Rats) of >4000 mg/kg and at 5% active, causes minimal eye irritation, and not considered a primary dermal irritant.

INCI Name: Cocamidopropylamine Oxide.

Typical Properties

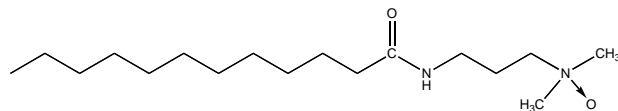
Water solubility	Complete
Physical form	Clear straw colored liquid
Color (Gardner)	1
Amine Oxide (m.w. 307).....	32.0±1.5%
Free Amine (m.w. 291).....	1.0% Maximum
Free Peroxide.....	0.3% Maximum
Specific gravity (25°C).....	0.99±0.04
Cloud Point	30°F(-1°C)
pH (10% aq.)	7.5±1.5
Pour Point.....	25°F(-4°C)
Flash point.....	>200°F (PMCC)
RVOC, U.S. EPA, %.....	0
Shipping	Non-Red Label

Handling Information

Refer to the Material Safety Data Sheet (MSDS) available from Mason Chemical Company for information on the safe use, handling and disposal of this product.

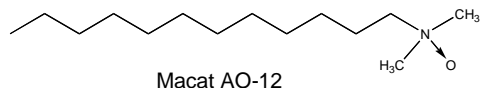
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Macat® Ultra CDO



Generally, alkyl (C₁₂ range) amine oxide surfactants are bleach stable, mild, high foaming nonionic wetting agents with performance unaffected by pH or water hardness. Mason Chemical Company produces a full range of C₈-C₂₂ alkyl amine oxides, with three C₁₂ range alkyl amine oxide surfactants: Macat AO-12 (high C₁₂ dimethyl amine oxide), Macat AO-14 (high C₁₄ dimethyl amine oxide) and Macat Ultra CDO (coconut oil derived C₈₋₁₈ amidopropyl dimethyl amine oxide).

When compared to Macat AO-12, Macat Ultra CDO with a higher molecular weight, broader alkyl distribution,



and internal amide linkage differs slightly. Both AO-12 and Ultra CDO are mild surfactants, especially when compared to strong anionic surfactants such as sodium lauryl sulfate, with Ultra CDO being slightly milder than AO-12. While both materials exhibit equivalent aqueous

surface tension reduction, AO-12 is a higher foamer with faster Draves wetting, with Ultra CDO exhibiting greater foam stability at elevated temperatures. Both materials perform equivalently across the a wide pH range, with AO-12 exhibiting better bleach stability and Ultra CDO better hydrotrope performance.

MACAT ULTRA CDO is a 30% active coco (C₁₂) amidopropyl dimethylamine oxide in water. ULTRA CDO is an effective wetting agent, viscosity builder, outstanding foam booster and grease cutter that is acid stable. The formulations below illustrate this effect.

Low pH Conditioning Shampoo for Damaged Hair

Ingredient	Wt%
Water.....	55.0
Ammonium Lauryl Sulfate, 30%.....	40.0
Macat Ultra CDO	5.0
Citric acid	to pH 4-5
Sodium Chloride.....	to max viscosity
Dyes, Fragrance, Etc.	q.s.

Note
Mix in order listed.
Clear shampoo at pH 4-5 with initial viscosity of 5,100 cps, building to 16,500 cps with 0.4% salt. By comparison, Lauramine oxide yields a low viscosity cloudy solution.

Mild Commercial Strength Hand Soap

Ingredient	Wt%
Water.....	79.07
Ammonium Lauryl Sulfate, 30%.....	10.0
Ammonium Lauryl Ether Sulfate, 60%.....	5.0
Masamide R-4 ⁽¹⁾	0.5
Macat Ultra CDO	1.0
Diethyleneglycol butylether ⁽²⁾	1.0
Citric acid ⁽³⁾	0.08
Ammonium Sulfate ⁽⁴⁾	0.35
Sodium Citrate ⁽⁴⁾	3.0
Dye & Fragrance	q.s.

Note
Mix in order listed.
Macat ULTRA CDO is an effective foam booster in this pH neutral, mild hand soap.
(1) PEG-4 Rapeseedamide
(2) Added oily soil release
(3) Adjust pH to skin mild 6-7
(4) Build viscosity