

CATEMOL MMM

(INCI: Cocamidopropyl Trimonium Chloride)

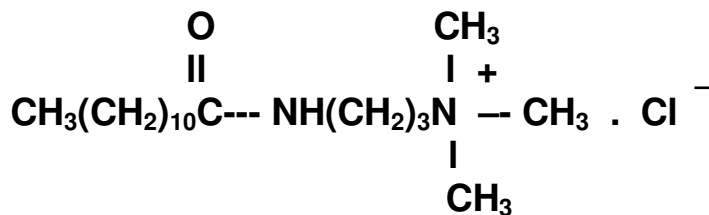
CATEMOL[®] MMM is a cocamidopropyl trimonium chloride quaternary; it is derived from a natural source (coconut oil). The presence of cocoamidopropyl moiety on the molecule confers a wide compatibility with anionic surfactants in addition to making it an excellent conditioner. Since **CATEMOL[®] MMM** is cationic, it is very substantive and forms a monomolecular layer on the substrate.

Some of the commonly recommended applications include hair care products such as shampoos, hair conditioners and cream-rinses. **CATEMOL[®] MMM**, being a quaternary, also offers anti-static properties to the substrate thus in the case of hair treatment it is expected to mitigate static-flyaway and provide moisturization.

The data contained in this Phenomenon supports the following properties for **CATEMOL[®] MMM**.

- Hair conditioning quaternary. Superior to CocoTrimmonium Chloride or PQ-10 (Polyquaternium-10).
- Viscosity builder and thickening agent for SLS and SLES shampoo systems at low concentrators.
- **CATEMOL[®] MMM** is much more compatible with SLS and SLES (higher haze point) than CocoTrimmonium Chloride.
- While **CATEMOL[®] MMM** forms gels with SLS and SLES, CocoTrimmonium Chloride does not.
- Foam stability of **CATEMOL[®] MMM** in SLES systems is clearly superior to CocoTrimmonium Chloride or PQ-10.

CATEMOL[®] MMM can be described as:



Trade Name	CATEMOL[®] MMM
INCI	Cocamidopropyl Trimonium Chloride
CAS #	52913-31-5

SOLUBILITY

WATER	m
PROPYLENE GLYCOL	m
ETHANOL 200 Proof	m
ETHANOL 190 Proof	m
MINERAL OIL	m
ISODODECANE	i
ISOPROPYL MYRISTATE	i
CASTOR OIL	m
CYCLOMETHICONE	i
DIMETHICONE	i
ISONONYL ISONONANOATE	i
PENTAERYTHRITYL TETRAETHYLHEXANOATE	i

i = insoluble
m = miscible (all %'s)

CATEMOL[®] MMM is very compatible with commonly used SLS (Sodium Lauryl Sulfate) and SLES (Sodium Lauryl Ether Sulfate). However, it is observed that the limit of tolerance for a haze point (an indicator of incompatibility) is much higher for **CATEMOL[®] MMM** as against another commonly used Cocotrimonium chloride.

In a comparative study **CATEMOL[®] MMM** gave a gel with SLS or SLES against CocoTrimmonium Chloride which did not form gels. Also a noteworthy aspect of the comparison is that the gels formed by combination with **CATEMOL[®] MMM** are of very high viscosity response in the formulation.

Table: Quantity of Quaternary (10% Active) required to haze point of 50gms SLS or SLES (10% Active)

Quaternary 10%Active, Gms.	Aionic 10% Active, Gms.	Haze Point Tolerance Gms.	Appearance	Viscosity, cps.
CATEMOL[®] MMM	50.0 (SLS)	21.25	Gel	13400
CocoTrimmonium Chloride	50.0 (SLS)	17.63	No gelling	< 10
CATEMOL[®] MMM	50.0. (SLES)	20.23	Gel	50000
CocoTrimmonium Chloride	50.0 (SLES)	17.44	No gelling	< 10

FOAMING CHARACTERISTICS:

CATEMOL[®] MMM yields a thick gel with a viscosity of well over 10,000 cps. for both SLS and SLES systems. **CATEMOL[®] MMM**/Anionic test solutions produced above average foam heights without suppression and extended foam stability of well over 24 hours or 10 times greater than SLS and SLES.

FOAM HEIGHTS OF SLES AND QUATERNARIES COMBINATIONS

Quaternary	Foam Ht. max mls.	Foam Ht. initial, mls.	Foam Ht. final, ml	Foam Stability min.
CATEMOL[®] MMM	300	200	200	1440
CocoTrimmonium Chloride	200	100	150	1440
PQ-10	200	100	150	1440
SLES alone	450	350	275	180

The foam stability is the same in case of the three quaternary combinations; however, the foam stability of the SLES control is very poor. The foam height comparisons show clearly that **CATEMOL[®] MMM** is far superior to other two quaternaries.

DRY COMBING/CONDITIONING BENEFITS

Instrumental dry combing analysis of human hair tresses treated with aqueous solutions confirmed conditioning efficiency.

Average Values of Combing Force (grams)

Quaternary	Total Score
CATEMOL[®] MMM	13.20
PQ-10	19.04
Control, Water	18.22

SPECIFICATIONS

Appearance @ 25°C	Clear Amber Liquid
Color (Gardner)	8 Max
Solids , 4hr@105°C	60 min.
pH, (10%, DW)	5.5-7.5

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