



g Suga®Quat

Naturally-Derived Cationic Conditioners

Suga®Quat is covered under patent 6,881,710
CTFA/INCI names are listed inside this bulletin

INTRODUCTION

The **Suga®Quat** series of naturally-derived conditioning quats brings formulators new ingredients that provide excellent conditioning of hair and skin while being considerably milder than traditional quats. The **Suga®Quat** series offers the formulator naturally-derived ingredients from renewable resources that are low in irritation to eyes and skin.



WHY USE SUGA®QUAT?

- Biodegradable
- Naturally derived
- Soft after-feel
- Low irritation profile
- No greasy build-up
- Excellent wet comb properties
- Formulates with anionics
- Supports viscosity in shampoos
- Enhances preservation of formulas

APPLICATIONS

- Hair conditioners
- 2-in-1 shampoos
- Body washes
- Facial cleansers
- Wipes
- Styling products
- Hand sanitizers
- Baby products
- Shower gels

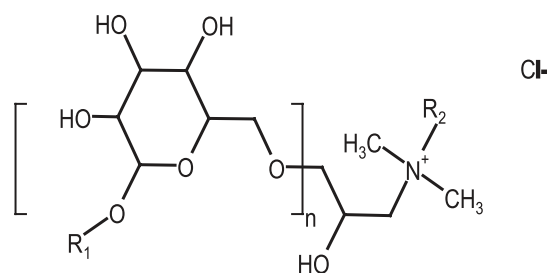
GREENSTAR RATINGS



Suga®Quat L-1010	8.01
Suga®Quat L-1210	8.13
Suga®Quat S-1010	8.23
Suga®Quat S-1210	8.32
Suga®Quat S-1218	7.81
Suga®Quat TM-8610	7.24

greenstarproducts.org

STRUCTURE





CTFA/INCI NAMES

Suga [®] Quat L-1010	Laurdimoniumhydroxypropyl Decylglucosides Chloride
Suga [®] Quat L-1210	Laurdimoniumhydroxypropyl Laurylglucosides Chloride
Suga [®] Quat S-1010	Stearldimoniumhydroxypropyl Decylglucosides Chloride
Suga [®] Quat S-1210	Stearldimoniumhydroxypropyl Laurylglucosides Chloride
Suga [®] Quat S-1218	Stearldimoniumhydroxypropyl Laurylglucosides Chloride
Suga [®] Quat TM-8610	Cocoglucosides Hydroxypropyltrimonium Chloride

TYPICAL PROPERTIES

<u>PROPERTY</u>	<u>TM-8610</u>	<u>L-1010</u>	<u>L-1210</u>
Color, Gardner	< 1	< 1	1
Activity	30.0	30.0	30.0
pH (10% aqueous)	7.0	7.0	7.0
Ross-Miles Foam Height (1% active), mm			
Immed.	145	145	160
1 minute	130	135	145
5 minutes	125	130	145
Draves Wetting (1% active), seconds	3.4	4	9
Compatibility, 5% active solution		Ratios from 3:2 to 1:5	
5% active SLS	Soluble, all ratios	Cloudy at 3:2 (thickens)	Cloudy at 1:1
5% active DSLS	Soluble, all ratios	Soluble, all ratios	Cloudy at 1:5 (thickens)
<u>PROPERTY</u>	<u>S-1010</u>	<u>S-1210</u>	<u>S-1218</u>
Color, Gardner	< 1	1 +	< 1
Activity	30.0	30.0	30.0
pH (10% aqueous)	7.0	7.0	7.0
Ross-Miles Foam Height (1% active), mm			
Immed.	160	160	110
1 minute	145	140	100
5 minutes	140	135	95
Draves Wetting (1% active), seconds	15	15	13
Compatibility, 5% active solution		Ratios from 3:2 to 1:5	
5% active SLS	Soluble, all ratios	Cloudy at 3:2 (thickens)	Cloudy at 1:1(thickens)
5% active DSLS	Cloudy at 3:2 (thickens)	Cloudy, all ratios. (thickens)	Cloudy at 2:1 (thickens)



TOXICOLOGICAL PROPERTIES

EYE

The eye irritancy evaluation of **Suga®Quats** was done using the chorioallantoic membrane technique. This test utilizes the inner membrane of a hen's egg to gauge the irritation potential of a compound by visual observation of injurious changes in the membrane. **Suga®Quat S-1210** scored 8.5, and is milder than a leading brand of baby shampoo.

SKIN

A study was performed adhering to ICH Guideline E6 and 21 CFR parts 50 and 56. Fifty-seven (57) volunteers, males and females, ranging in age from 16 to 76 were subjected to a patch test. A 1" by 1" absorbent pad was moistened with 0.2 ml of liquid and applied to the backs of the subjects between the scapulae. The patch sites were inspected at 48 hours for gross changes. It was observed that there was a complete absence of skin change. The test sites were evaluated again at 72 hours. Once again the observation was negative skin changes. Under the test conditions, **Suga®Quats** did not indicate a potential for dermal irritation.

FORMULATIONS

SUPER CONDITIONER FOR DAMAGED HAIR

Phase	Compound	Weight %
A	Deionized Water	82.91
A	Tetrasodium EDTA	0.10
A	Glycerin 96%	2.50
A	Guar Hydroxypropyl Trimonium Chloride	0.50
B	Suga®Quat S-1210	3.50
B	Glyceryl Stearate	0.50
B	Behenyl Alcohol	2.00
B	Stearalkonium Chloride	1.50
B	Dimethicone, 1,000 cps	1.00
B	Cyclomethicone	5.00
C	Methylchloroisothiazolinone & Methylisothiazolinone	0.05
D	Fragrance	0.30
E	Citric Acid (25% solution)	0.14

PROCEDURE: Combine Phase A and heat to 75°C. Heat Phase B to 75°C. Slowly add Phase B to Phase A with agitation. Add Phase C. Cool to 30°C and add remaining phases.

ULTRA-MILD BABY SHAMPOO

Phase	Compound	Weight %
A	Water	69.40
A	Tetrasodium EDTA	0.10
A	Suga®Nate 160 (Sodium Laurylglucosides Hydroxypropyl Sulfonate)	12.00
A	Suga®Quat TM-8610	4.50
A	Cola®Teric COAB (Cocamidopropyl Betaine)	4.50
A	Cola®Teric DLB (Dimer Dilinoleamidopropyl Dibetaine)	5.00
A	PEG-8 Dimethicone	1.00
A	Fragrance Baby Type 733-C WS	0.50
B	PEG-120 Methyl Glucose Trioleate & Propylene Glycol & Water	3.00

PROCEDURE: Combine Phase A and mix until uniform. Add dye and preservative as needed with continued stirring. Add Phase B and mix until uniform. Adjust pH with Citric Acid.



ANTIMICROBIAL PROPERTIES

A study was done to compare the performance of several of the **Suga[®]Quat** products against strains of bacteria, yeast and mold. This study by an outside microbiological laboratory is shown below.

Suga[®]Quat S-1210 and **S-1218** were seen to have broad-spectrum killing properties in this study; this makes these products useful in self preserved and preservative free system for personal care. Our own testing continues in this unique application area for validation of **Suga[®]Quats** in preservative free systems. We recommend that any use of **Suga[®]Quats** in such applications be challenge tested for verification.

Suga[®]Quats ZONE INHIBITION STUDY – PROJECT #60720
8/2/06

BIO-CONTROL CONSULTANTS, INC. • 43 MOHICAN DRIVE • WESTFIELD, NJ 07090

PURPOSE: To determine the antimicrobial capability of two (2) **Suga[®]Quat** (alkyl polyglucoside) variations utilizing the zone inhibition technique. The test materials were evaluated for gross antimicrobial activity against a series of three (3) test organisms: *Pseudomonas aeruginosa* (Gram negative bacteria); *Candida albicans* (yeast) and *Aspergillus niger* (mold). Results of the assays are presented below.

TEST SAMPLES:

- 1) **Suga[®]Quat S-1210** 13678D06 (2.0% and 1.0% concentrations)
- 2) **Suga[®]Quat S-1218** RJC-02-081 (2.0% and 1.0% concentrations)

COMBINED ACTIVITY SUMMARY

TEST SAMPLE	Psa	Ca	An	Score	Comments
1) Suga[®]Quat S-1210	1	2	3	10	Excellent Psa; V Good Yeast; Good Mold
2) Suga[®]Quat S-1218	1	1	2	7	Excellent Activity

Note: The lower the score, the greater the activity.

COMMENTS

- **Suga[®]Quat S-1218** demonstrated very good antimicrobial activity against all three of the testorganisms employed. This material compares favorably to the general antimicrobial profile of a commercial product known for antimicrobial activity at both the 1.0% and 2.0% concentrations.
- Both **Suga[®]Quat S-1210** and **Suga[®]Quat S-1218** demonstrated excellent activity at the 2.0% level, however, significant differences were observed with yeast and fungal activity at the lower concentration.
- Overall, the **Suga[®]Quats** look very promising providing that the use concentration is maintained at a high enough level. This should not present an issue since the normal recommended formula use recommendation above a 2.0% concentration.

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