Genamin® Quats

THE 'MOST WANTED' HAIR CONDITIONING PACKAGE FOR CREAM RINSE

what is precious to you?
Quaternary Ammonium Compounds

- **Genamin® KDMP / BTLF**
  - Behentrimonium Chloride
- **Genamin® STAC**
  - Steartrimonium Chloride
- **Genamin® CTAC / CTAC 50 / CTAC 50 ET**
  - Cetrimonium Chloride
- **Genamin® DSAP**
  - Distearyldimonium Chloride
- **Genamin® PQ-43**
  - Polyquaternium-43
- **Genamin® PDAC**
  - Polyquaternium-6
Genamin® Quats: Summary

- Behentrimonium Chloride (Genamin® KDMP / BTLF) in combination with Cetrimonium Chloride (Genamin® CTAC) is the established market standard for superior cream rinse formulations
- Clariant market leader in Behentrimonium Chloride production
- Depending on the final product segment, Clariant provides various grades of Genamin® Quats
- Genamin® PQ 43 is a unique aqueous solution for body wash formulation: Compatible with SLES and other anionic surfactants, easy to handle, effective
- Clariant formulation expertise: Broad variety of guide recipes and manufacturing advises available on request
  - Cream rinse formulation for all type of hair
  - Two phase leave on
  - Foam / Mousse
Composition of Hair Rinses

- Quat
- Emulsifier
- Thickening Agent
- Oils
- Active Ingredients
- Fragrance
- Acids
- Dyestuff solution
- Water

Problem: more than 1000 conditioning agents, more than 110 Quats listed @ CTFA
Leading US Conditioners

Ranked by dollar sales (in millions) for the year ended Oct. 2002

Source: Information Resources Inc., HAPPI 12/2002
CLAIROL Herbal Essences Intensive Blends Conditioner, Protecting for Colored / Permed Hair

Ingredients
- Water, Cetearyl Alcohol, Cetyl Esters, Behentrimonium Chloride, Panthenol, Aloe Barbadensis Leaf Juice, (Safflower) Seed Oil, Hydrolyzed Vegetable Protein, Gardenia Florida Extract, Tocopherol, Amodimethicone, Cyclomethicone, Citric Acid, Stearamidopropyl Dimethylamine, Dimethicone Copolyol, Cetrimonium Chloride, Fragrance, Propylene Glycol, Disodium EDTA, Trideceth 12, Methylparaben, Propylparaben, Methylchloroisothiazolinone, Methylisothiazolinone, Ext. Violet 2

Claim
- Herbal Essences Intensive Blends Protecting Conditioner for Colored / Permed Hair:
  - Protects hair condition
  - Actually enriches color treated hair
  - Provides beautiful, long-lasting effects
  - Maintains the vitality & shine of color treated hair
  - Is great for everyday use
Infusium 23
Conditioner, Moisturizing for Normal to Dry Hair

Ingredients
- Water, Cetearyl Alcohol, Behentrimonium Chloride, Cetyl Esters, Ammodimethicone, Panthenol, Dimethicone Copolyol, Glycerin, Betaine, Sorbitol, Serine, Glutamic Acid, PEG-8/SMDI Copolymer, Hydroxyethylcellulose, Glycine, Lysine, Threonine, Arginine, Alanine, Palmitoyl Myristyl Serinate, Behenic Acid, Oleic Acid, Palmitic Acid, Linoleic Acid, Stearic Acid, Proline, Arachidic Acid, PEG-8, Cetrimonium Chloride, Fragrance, Trideceth-12, Polyquaternium-11, Sodium PCA, Phenoxyethanol, DMDM Hydantoin, Propylparaben

Claim
- Corrects, Restores, Structurizes
  - Infuses hair with 23 essential pro-vitamin & treatment ingredients
  - Releases tangles and leaves hair feeling silky and clean
  - Clean rinsing formula

Infusium 23 is specially formulated to fortify the hair cuticle, giving it healthy texture, improved manageability and liveliness. It rinses easily, releases tangles and leaves hair feeling clean, silky and greaseless without oily buildup.
L'Oreal
ColorVive Creme Conditioner, Regular

Ingredients
- Water, Cetearyl Alcohol, Behentrimonium Chloride, Cetyl Esters, Amodimethicone, Camphor Benzalkonium Methosulfate, Fragrance, Methylparaben, Trideceth-12, Cetrimonium Chloride, Chlorhexidine Dihydrochloride

Claim
- Only ColorVIVE Creme Conditioner has this unique formula with a Protective Ultraviolet Filter. ColorVIVE revitalizes the beauty of your color and keeps it truer, longer-without adding color or changing your hair color.
CREAMRINSE B II / 1118

With Genamin® BTLF for excellent dry combability and volume, with Genamin® CTAC for perfect wet combability and anti-static effect

A. Genamin® BTLF (Clariant) 2.50%
   Behentrimonium Chloride

Genamin® CTAC (Clariant) 3.00%
   Cetrimonium Chloride

Hostacerin® T-3 (Clariant) 1.50%
   Ceteareth-3
   Cetyl Alcohol 3.00%

B. Water ad 100.00 %

C. Fragrance 0.30 %
   Dyestuff solution q.s.
   Preservative q.s.

D. Citric Acid (10 % in water) to pH 4.0 q.s.

I. Melt A at 75 °C.

II. Heat B to 75 °C.

III. Stir II into I.

IV. Stir until cool.

V. At 35 °C add the components of C to IV.

VI. Finally adjust the pH with D.
## Technical properties of Quat. Ammonium Compounds

<table>
<thead>
<tr>
<th></th>
<th>Usage concentration [%AI]</th>
<th>Wet Combing</th>
<th>Softening effect</th>
<th>Antistatic action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genamin® CTAC</td>
<td>1.0 - 3.0</td>
<td>+++</td>
<td>0</td>
<td>++</td>
</tr>
<tr>
<td>Genamin® KDMP/BTLF</td>
<td>0.5 - 2.0</td>
<td>++</td>
<td>+++</td>
<td>+</td>
</tr>
<tr>
<td>Genamin® STAC</td>
<td>0.5 - 2.0</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Genamin® DSAP</td>
<td>0.5 - 2.0</td>
<td>++</td>
<td>++</td>
<td>+</td>
</tr>
</tbody>
</table>
Influence of Chemical Structure

![Chemical structure](image)

- Lauryl $C_{12}$
- Cocoyl $C_{8-18}$
- Cetyl $C_{16}$ CTAC
- Stearyl $C_{18}$ STAC
- Behenyl $C_{22}$ KDMP/BTLF

Water solubility

Conditioning effect
Genamin® KDMP / BTLF

- INCI: Behentrimonium Chloride
  - Outstanding conditioner Quat
  - Gives volume and body to hair
  - Provides smooth, silky, "natural" feeling
  - Synergistic effects in combination with Genamin® CTAC
  - Excellent dry combability
  - Superior to silicones on damaged hair!
Synthesis of Genamin® KDMP

C20-C22-Alkyldimethylamine dissolved in Isopropanol

Partial evaporation of Isopropanol (thin layer evaporator)

Methylchloride

melt of C20-C22-Alkyltrimethyl ammonium chloride with ca. 18 wt-% Isopropanol

pelletization

Genamin® KDMP
Synthesis of Genamin® BTLF

C20-C22-Alkyldimethylamine dissolved in Dipropylene glycol

Partial evaporation of volatile residuals (thin layer evaporator)

Methylchloride

Melt of C20-C22-Alkyltrimethyl ammonium chloride with 30 wt-% Dipropylene glycol

Pelletization

Genamin® BTLF
Comparison composition
Genamin® KDMP /Genamin® BTLF

Dipropylene glycol
Isopropanol
Behentrimonium chloride
Preparing Cream Rinses with Genamin® KDMP

- Genamin® KDMP can be incorporated to both, the aqueous or the oil phase:
  
  - Introduction via the aqueous phase
    Safe use / no flammable vapour formed
    requires hydrobic emulsifier with low HLB-value
    e.g. Hostacerin® DGI (INCI: Polyglyceryl- 2 Sesquiolesterate)
  
  - Introduction via the oil phase
    requires hydrophilic emulsifier with high HLB-value
    e.g. Hostaphat® KL 340 D (INCI: Trilaureth- 4 Phosphate)
Genamin® CTAC

- INCI: Cetrimonium Chloride
  - Water-soluble
  - Very good antistatic properties
  - Excellent wet combability
  - Synergistic effects in combination with Genamin® KDMP
Genamin® DSAP

- INCI: Distearyldimonium Chloride
  - Very good softening effect
  - Antistatic properties
  - High substantivity
Genamin® PDAC

- **INCI**: Polyquaternium-6

  - Readily water-soluble
  - High substantivity to hair without leaving visible films
  - Compatible with amphoteric and anionic co-surfactants like amphoacetates and acylglutamates
  - Application in dyes, perms, conditioner shampoos and soaps
Genamin® PQ 43 (former Bozequat 4000)

- INCI: Polyquaternium-43
- Liquid additive for rinse off surfactant based formulations: hair care and skin cleansing products
- Properties:
  - Leaves a pleasant and smooth/soft feel
  - Compatible with all types of surfactants (anionic, cationic, amphoteric)
  - Enhances shine
  - Antistatic benefits
  - Formulations are less slippery than PQ 10 based systems
- Applications: shower gels, soaps, shampoos
  hairstyling mousses, conditioners, hair gels, sprays
- Very effective: Typical usage concentration: 0.1 - 2 %
Market Products with Genamin® PQ 43

Garnier 2-in-1 Shower & Care

- Aqua, Sodium Laureth Sulfate, Glycerin, Coco-Betaine, Laureth-11, Carboxylic Acid, Sodium Chloride, Perfume, Hexylene Glycol, Disodium Laureth Sulfosuccinate, Citric Acid, Sodium Methylparaben, PEG-150 Distearate, Polyquaternium-43, DMDM Hydantoin, Polyquaternium-10, Tocopheryl Acetate
Market Products with Genamin® PQ 43

**Tetesept: HydroCreme Dusche Milk & Flower**

- Aqua, Sodium Laureth Sulfate, Glycerin, Cocamidopropyl Betaine, Ammonium Lauryl Sulfate, Perfume, Cocamide DEA, Polyquaternium-43, PEG-7 Glyceryl Cocoate, Styrene/Acrylates Copolymer, Sodium Caseinate, Propylene Glycol, Bletilla Striata, Citric Acid, Hydroxypropyl Guar Hydroxypropyltrimonium Chloride, Phenoxyethanol, Methylparaben, Ethylparaben, Propylparaben, Butylparaben, Isobutylparaben, Dehydroacetic Acid, Disodium EDTA
# CREAMRINSE FOR COLORED HAIR

**BII / 1128**

<table>
<thead>
<tr>
<th>Component</th>
<th>Manufacturer</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Genamin® KDMP</td>
<td>(Clariant)</td>
<td>2.50 %</td>
</tr>
<tr>
<td>Behentrimonium Chloride</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Genamin® CTAC</td>
<td>(Clariant)</td>
<td>3.00 %</td>
</tr>
<tr>
<td>Cetrimonium Chloride</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cetearyl Alcohol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hostacerin® DG5B</td>
<td>(Clariant)</td>
<td>1.50 %</td>
</tr>
<tr>
<td>PEG-4 Polyglyceryl-2-Stearate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isopropyl Palmitate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Olive Oil</td>
<td>1.00 %</td>
<td></td>
</tr>
<tr>
<td>SilCare® Silicone 41M15</td>
<td>(Clariant)</td>
<td>0.50 %</td>
</tr>
<tr>
<td>Caprylyl Methicone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uvinul MS 40</td>
<td>0.50 %</td>
<td></td>
</tr>
<tr>
<td>Benzophenone-4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B Water</td>
<td></td>
<td>ad 100.00 %</td>
</tr>
<tr>
<td>Sorbitol</td>
<td>2.00 %</td>
<td></td>
</tr>
<tr>
<td>Glycerin</td>
<td>2.00 %</td>
<td></td>
</tr>
<tr>
<td>D- Panthenol</td>
<td>1.00 %</td>
<td></td>
</tr>
<tr>
<td>C Tocopheryl Acetate</td>
<td></td>
<td>0.50 %</td>
</tr>
<tr>
<td>Extrapone Eibisch Special</td>
<td>2.00 %</td>
<td></td>
</tr>
<tr>
<td>Aqua, Ethoxydiglycol, Propylene Glycol, Althea Officinalis Extract, Butylene Glycol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cosi Silk soluble</td>
<td>1.00 %</td>
<td></td>
</tr>
<tr>
<td>Hydrolyzed Silk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chitin Liquid</td>
<td>1.00 %</td>
<td></td>
</tr>
<tr>
<td>Carboxymethylchitin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrotriticum WQ</td>
<td>1.00 %</td>
<td></td>
</tr>
<tr>
<td>Hydroxypropyltrimonium Hydrolyzed Wheat Protein</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fragrance</td>
<td>0.30 %</td>
<td></td>
</tr>
<tr>
<td>Dyestuff solution</td>
<td>q.s.</td>
<td></td>
</tr>
<tr>
<td>Preservative</td>
<td>q.s.</td>
<td></td>
</tr>
<tr>
<td>D Sodium Hydroxide to pH 4.0</td>
<td>q.s.</td>
<td></td>
</tr>
</tbody>
</table>

## Procedure

I. Melt A at 80 °C

II. Dissolve B and heat it to 80 °C

III. Stir II into I and stir until cool

IV. At 35 °C add the components of C to III

V. Finally adjust the pH with D.
Thank you for your attention!