

# Salt-Free Surfactants for Personal Care

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WASH YOUR HANDS

# Remember to *Wash Your Hands!*



- Most Often Missed
- Often Missed
- Less Often Missed

Wash your hands for ***at least*** 15 seconds.

The time it takes is less important than making sure you clean ***all areas*** of your hands.

These areas are most often missed while washing:

- Thumbs
- Fingertips
- Between fingers

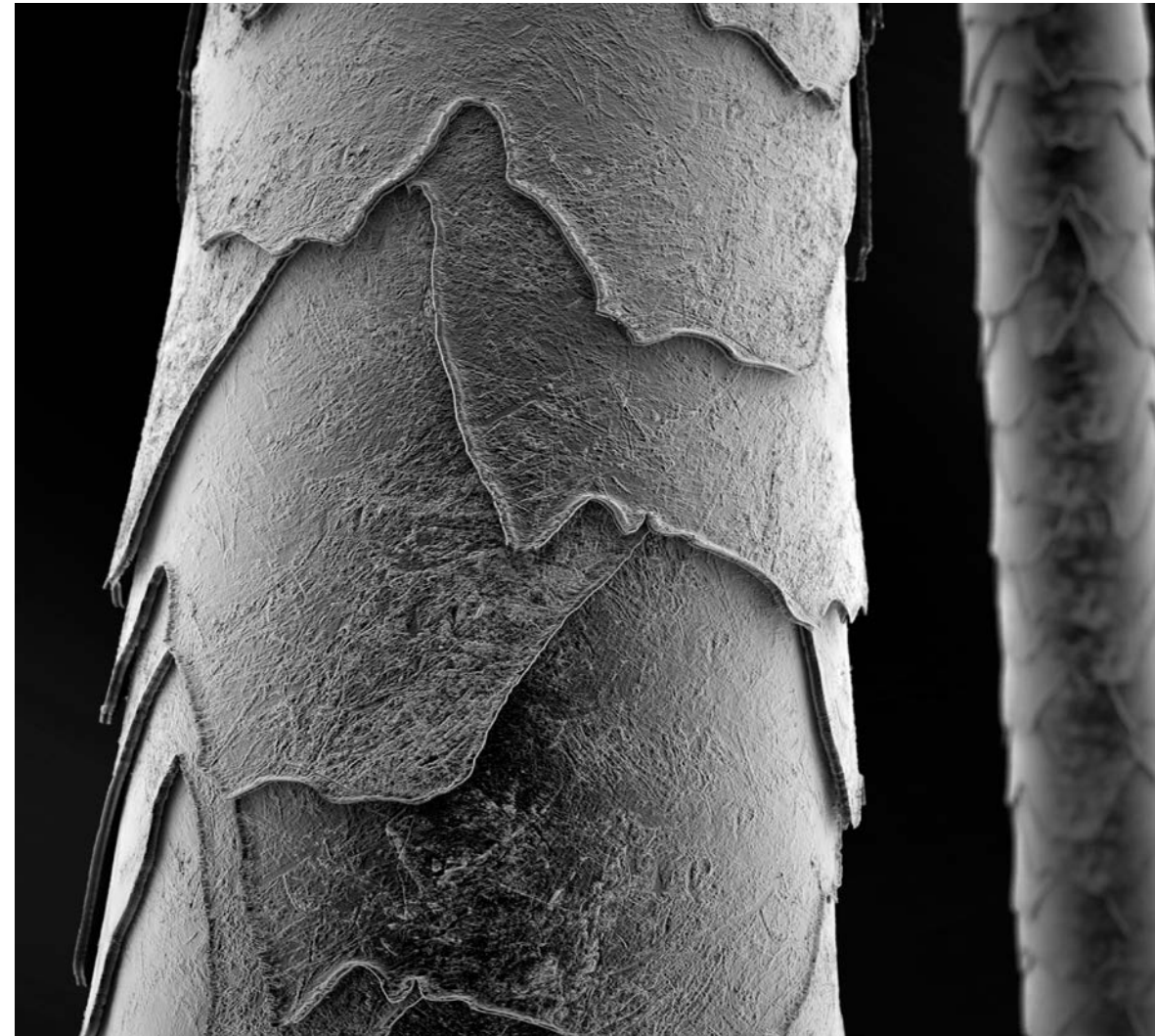
## Outline

- Why Salt-Free?
- Salt-Free Commercial Examples
- Salt-Free Considerations
- Salt-Free Technologies
  - Amphoteric
  - Anionics
  - Nonionics
- Low-Salt Surfactants
- No Added Salt Formulations



## Why Salt-Free?

- Sodium Chloride is added to most surfactant systems to increase viscosity
- Sodium Chloride can be considered a desiccant (removes water from surrounding)
- “Dry” hair is common concern among consumers
- Common causes of dry hair
  - Styling tools
  - Reshaping treatments
  - Color treatments
  - High friction styling habits
  - Diet/health
- Sodium chloride is said to negatively impact keratin treated hair.



## Commercial Examples

- **Luxe Organix Rejuvenating Argan Oil Shampoo**

- **Ingredients:** *Water, Sodium Lauryl Sulfoacetate, Disodium Laureth Sulfosuccinate, Sodium Lauroyl Sarcosinate, Cocamidopropylamine Oxide, Sodium Cocoyl Isethionate, Propylene Glycol, Sodium Lauroamphoacetate, Argania Spinosa Kernel Oil (Moroccan Argan Oil), Acrylates Copolymer, Glycol Stearate, Silicone Quaternium-16, Sodium Methyl Cocoyl Taurate, Lauryl Methyl Gluceth-10 Hydroxypropyldimonium Chloride, Fragrance, Panthenol, Guar Hydroxypropyltrimonium Chloride, Citric Acid, PEG-55 Propylene Glycol Oleate, Undeceth-11, Butyloctanol, Undeceth-5, Polyquaternium-59, Butylene Glycol, Methylisothiazolinone, Orange 4/CI 15510, Red 40/CI 16045, Limonene*
- **Relevant Claims:** *SAFE FOR COLORED AND KERATIN TREATED HAIR, WON'T STRIP. Preserve your treatment and protect your investment. Sulfate free and sodium chloride free shampoo and conditioner set recommended by professional stylists. Just what you've been searching for.*



## Commercial Examples

- **Acure Simply Smoothing Coconut & Marula Shampoo**

- **Ingredients:** *Aqua (Water/eau), Cocamidopropyl Betaine, Sodium Lauroyl Methyl Isethionate, Betaine, Glycerin, Cocoglucosides Hydroxypropyltrimonium Chloride, Aloe Barbadensis Leaf Juice\*, (Coconut) Oil, (Marula) Seed Oil, (Kukui) Seed Oil, (Shea) Butter, (Coconut) Water, (Avocado) Oil, (Acai) Fruit Extract\*, (Blackberry) Fruit Extract\*, (Pomegranate) Extract\*, (Rosehip) Fruit Extract\*, (Calendula) Flower Extract\*, (Rooibos) Leaf Extract\*, (Matricaria) Flower Extract\*, Sodium Methyl Cocoyl Taurate, Sodium Cocoyl Glutamate, (Sweet Almond) Oil, Vanillin, (Orange) Peel Oil, Juniperus Mexicana Oil, (Tonka Bean) Seed Oil, (Coffee) Seed Oil, (Clove) Flower Oil, Citric Acid, Sodium Levulinate, Levulinic Acid, Guar Hydroxypropyltrimonium Chloride, Potassium Sorbate.*
- **Relevant Claims:** *Includes marula oil for hair, argan oil for hair, aloe vera juice extract, aloe vera soap and acai, and is also color safe, vegan, gluten free, sulfate free, paraben free, phthalate free, cruelty free, petroleum free, PEG free, synthetic fragrance free, silicone free and 100% biodegradable*



## Commercial Examples

- **NYK1 Keratin & Colour Aftercare**

- *Ingredients: Aqua, Sodium Lauryl Sulphoacetate, Cocamidopropyl Betaine, Disodium Laureth Sulfosuccinate, Decyl Glucoside, Glycerin, Polyquaternium 7, Phenoxyethanol, Peg-150 Distearate, Peg-40 Hydrogenated Castor Oil, Cocos Nucifera (Coconut) Oil, Parfum*  
*Contains: Benzyl Benzoate, Coumarin*
- *Relevant Claims: Salt Free and Sulphate Free Shampoo and Salt Free and Sulphate Free Conditioner can be used on ALL hair types, and work essentially to protect hair keratin and colour treatments that you pay hundreds of pounds for at a hair salon. Protect your hair colour treatment with NYK1 Salt Free and Sulphate Free Shampoo and NYK1 Salt Free and Sulphate Free Conditioner.*



## Commercial Examples

- **Damila Salt & Sulfate Free Shampoo**

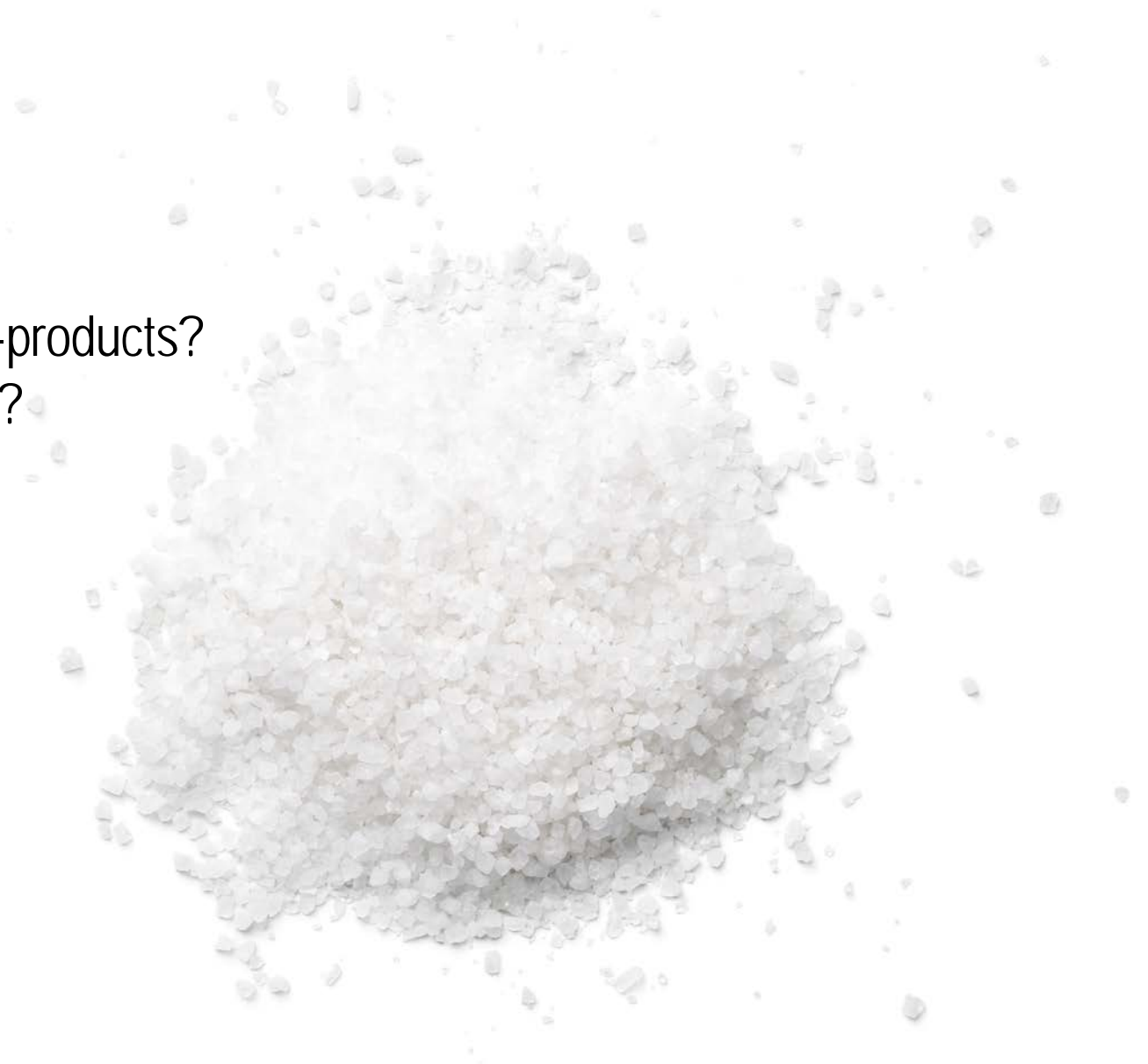
- **Ingredients:** *Water, Sodium Lauryl Sulfoacetate (and) Disodium Laureth Sulfosuccinate, Cocamidopropyl Betaine, Decyl Glucoside, Aloe Barbadensis (Aloe Vera) Leaf Extract, Polyquaternium-7, Cocamide DEA, Sodium Lauroyl Sarcosinate, Amodimethicone (and) Glycerin (and) C11-15 Pareth-7 (and) Laureth-9 (and) Trideceth-12, PEG-150 Pentaerythrityl Tetrastearate (and) PEG-6 Caprylic/Capric Glycerides, Panthenol, Fragrance, DMDM Hydantoin, Hyrdolyzed Keratin, Silk Amino Acids, Hydrolyzed Silk Protein, Actinidia Chinesis (Kiwi) Seed Extract, Methylchloroisothiazolinone (and) Methylisothiazolinone*
- **Relevant Claims:** *This post keratin shampoo works well to replenish keratin and protein treatments. It has mild surfactants and will not strip away the effects of the keratin complex. It helps extend life and enhances the results of the treatment.*





## Salt-Free Considerations

- What is a salt?
- Which salts are excluded?
- What about salts present in surfactants as by-products?
- Is it possible to create a truly salt-free product?
- Is it necessary?



## Salt-Free Technologies

- For the purpose of this presentation, we will look at surfactants that
  - Contain minimal or no sodium chloride by-product
  - May themselves be “salts”
  - May contain other salts as processing aids (chelants, preservatives, etc)
  - May contain other salts as by-products
  - Are used for the purpose of formulating high foaming products.

## Salt-Free Amphoterics

- **Aminopropionates**
  - Sodium Lauraminopropionate
  - $\beta$ -Alanine analogs
- **Iminodipropionates**
  - (Di)sodium Lauriminodipropionate
  - Additional pH dependent properties
- **Amphopropionates**
  - Sodium Cocoamphopropionate, Disodium Cocoamphodipropionate
  - Low irritation potential
- **Amine oxides**
  - Lauramine Oxide, Cocamidopropylamine Oxide
  - Also occasionally classified as nonionics, can function as cationics at low pH.

## Salt-Free Anionics

- **Sulfated alcohols**
  - Sodium Lauryl/Laureth Sulfate, Ammonium Lauryl/Laureth Sulfate, Sodium Coco-Sulfate
  - Typically avoided as a class for the relevant application
- **Sulfonated olefins**
  - Sodium C14-16 Olefin Sulfonate
  - Low cost alkyl sulfate replacements
- **Isethionates**
  - Sodium Cocoyl Isethionate
  - Very popular sulfate replacements
- **Sulfosuccinates**
  - Disodium Lauryl/Laureth Sulfosuccinate, Disodium Ricinoleamido MEA Sulfosuccinate
  - Not as effective building viscosity
- **Phosphate esters**
  - (Potassium) Lauryl/Laureth Phosphate
  - Check supplier for salt content.

## Salt-Free Nonionics

- Alcohol Ethoxylates
  - Laureth-3, Laureth-4
  - Thickeners and dispersants
- PEG esters
  - PEG-150 Distearate, PEG-7 Glyceryl Cocoate
  - Emollients and thickeners
- Polyglyceryl esters
  - Polyglyceryl-10 Laurate, Polyglyceryl-6 Caprate
  - Thickeners and solubilizers
- Polysorbates
  - Polysorbate 20, Polysorbate 60
  - Solubilizers
- Alkanolamides
  - Cocamide MIPA, Dimethyl Lauramide
  - Thickeners

## Low Salt Surfactants

- Carboxylates
  - Trideceth-7 Carboxylic Acid, Laureth-6 Carboxylic Acid
  - Supplied substantially anhydrous, neutralized in-situ
  - Typically less than 1% salt
- Reduced salt betaines
  - Cocamidopropyl Betaine
  - Costly or involve flammable solvents
  - Few commercial products exist

## No Added Salt Formulations

- The majority of “salt-free” products in market simply have no added salt
- No added salt formulas are enabled by a variety of strategies:
  - High surfactant concentration
  - Increased use of amphoteric surfactants
  - Increased use of nonionic surfactants
  - Combinations of above

## No Salt Needed Surfactant Concentrates

- Cola<sup>®</sup> Det EQ-18

- INCI: *Decyl Glucoside, Cocamidopropyl Hydroxysultaine, Cocamidopropyl Betaine, Cocamide MIPA, Disodium Laureth Sulfosuccinate, Disodium Lauryl Sulfosuccinate*

- Cola<sup>®</sup> Det EQ-19 or EQ-20

- INCI (19): *Sodium C14-16 Olefin Sulfonate, Sodium Cocoamphoacetate, Cocamidopropyl Hydroxysultaine*

- INCI (20): *Sodium Laurylglucosides Hydroxypropylsulfonate, Sodium Cocoamphoacetate, Cocamidopropyl Hydroxysultaine*

- Suga<sup>®</sup> Det Mild

- INCI: *Sodium Laurylglucosides Hydroxypropylsulfonate, Sodium Methyl Cocoyl Taurate, Cocamidopropyl Hydroxysultaine, Sodium Bis-Hydroxyethylglycinate Coco-Glucosides Crosspolymer, Sodium Stearoyl Lactylate*



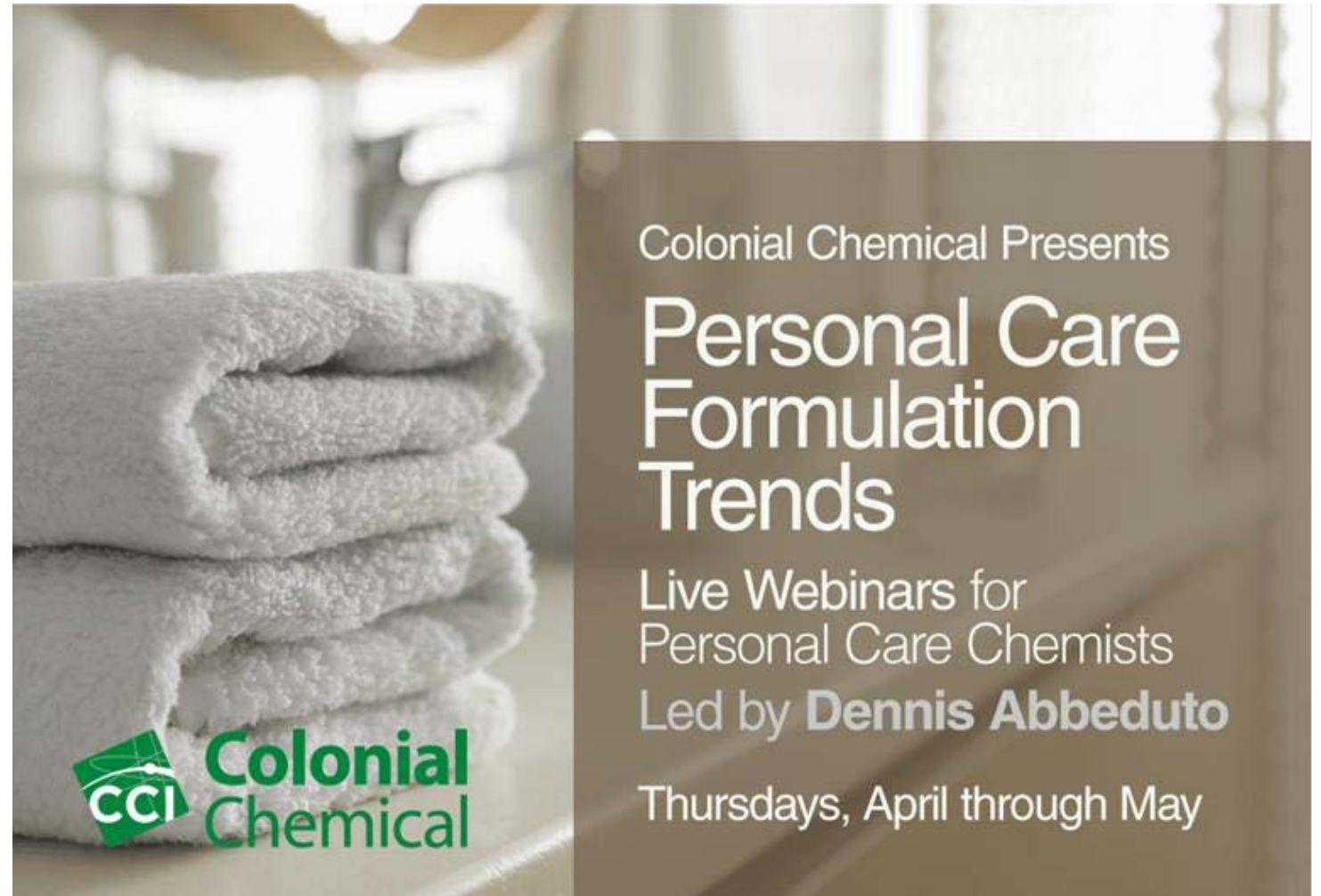
## Wrap Up

- The emerging “salt-free” claim presents new opportunities and challenges
- Ground rules are paramount to product selection
- A wide variety of salt-free and reduced salt surfactant options exist
- Successful formulations are achievable

## Webinar Series – Coming Events

- May 14 – Alternate Preservation
- May 21 – Dioxane-Free Formulas
- May 28 – Sulfate-Free Formulas

• <https://bit.ly/2XXTbEO>




Colonial Chemical Presents

# Personal Care Formulation Trends

Live Webinars for  
Personal Care Chemists  
Led by **Dennis Abbeduto**

Thursdays, April through May



# Thank you!

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