



# Recent advances in hair conditioning

Unlocking the secrets

# Cats wash their fur



# Birds preen their feathers



# Humans groom their hair





# The first conditioning aids

- ◆ Oils & fats
- ◆ Emulsified
  - As hair cream
- ◆ Bay rum
- ◆ Brilliantine

- ◆ Bay Rum Hair Wash
    - Zinc Sulfate
    - Quinine Sulfate
    - Tincture of cantharides
    - Bay Rum
    - Glycerine
    - Water
- 1898

# Soap Shampoo

1898

Lavender oil

Alcohol

Soft soap

Water

## ◆ Additives and rinses

– Vinegar

– Lemon

– Beer

– Rosemary oil

– Quillaia

– Camphor

– Jaborandi

• Pharmaceutical  
Formulas 1898

# Soapless Shampoo

1934

Sulfonated castor oil 63%  
Sulfonated olive oil 20%  
Paraffinum liquidum 5%  
Ethylene glycol 1.5%  
Perfume 0.5%  
Water 10%

- Modern Cosmetics  
F. Chilson 1934

- ◆ Additives and rinses
  - Bay rum
  - Quillaia
  - Castor oil
  - Menthol
  - Quinine sulfate
  - Citric acid
  - Henna
  - Chamomile

# Modern Shampoo

1950

- ◆ Sodium Lauryl Sulfate
- ◆ Sodium Laureth Sulfate
- ◆ Triethanolamine LS
- ◆ Triethanolamine LES
- ◆ Ammonium LS
- ◆ Ammonium LES
- ◆ Cocamide DEA



# The Conditioner is born

1957

- ◆ Alkyl ammonium salt            1% to 8%
- ◆ Fatty Alcohol/EGMS            1% to 5%
- ◆ Special Additive                0.10% to 3%
- ◆ Additives
  - Proteins & amino acids
  - Panthenol, PVP, urea
  - Oils & waxes e.g. cholesterol, lanolin, silicone
- ◆ Preservatives, colour, pH adjuster, perfume
- ◆ Water to 100%

Cosmetics, Science & Technology

– Sagarin 1957

# The Conditioner advances!

- ◆ Stearyl dimethyl benzyl ammonium chloride (SDBAC) 3.5%
- ◆ Cetyl alcohol 2.5%
- ◆ Paraffinum Liquidum 0.5%
- ◆ Water to 100%
  - Perfumes, Cosmetics & Soaps, Poucher 1974

- ◆ Cetrimonium Chloride (CTAC) 1.5%
- ◆ Stearyl alcohol 2.0%
- ◆ Oils 3%
- ◆ Water to 100%
  - Harry's  
Cosmeticology 1987



# Hair in poor condition

- Lank and greasy
- Dull
- Dry and unmanageable
- Difficult to comb
- Split ends
- Flyaway



# Hair in good condition

- ◆ Is easy to wet comb
- ◆ Is easy to dry comb
- ◆ Is manageable
- ◆ Has gloss and shine
- ◆ No split ends
- ◆ No hair welds



# Cosmetic hair treatments

- ◆ Cosmetic hair treatments that modify the hair surface
  - Shampoos
  - Hair conditioners
  - Hair sprays & other film-forming styling aids
    - If well designed these can improve condition



# Cosmetic hair treatments

- ◆ Cosmetic hair treatments that alter the interior fibre properties
  - Permanent hair colorants
  - Hair waving
  - Straightening agents
    - These processes have a tendency to make hair brittle &/or porous



# Problem

# Cause

# Cure

Dull Hair	High pH shampoo Raised cuticle	Acid rinse Glossing additives
Lank and greasy feeling	Poor cleansing Greasy-conditioner Over-conditioning	Improved product formulation
Dry and unmanageable	Aggressive shampoo	Improved product formulation Moisturising additives



# Problem

# Cause

# Cure

Difficult to comb	Raised cuticle	Acid rinse Added slip & lubrication
Flyaway	Aggressive shampoo Anionic charge Static through combing	Neutralise charge Cationic rinse
Split ends	Wet & dry combing forces	Improve combability with conditioning additives



# Conditioning Shampoos

- ◆ Mild formulations
  - More user friendly than SLS/SLES
  - reduced anionic active
  - increased amphoteric levels
- ◆ 2-in-1 with added conditioning aids
  - Cationic polymers
  - Silicones

& other additives



# Shampoos & cationic polymers

- ◆ Used at 0.1% to 0.5%
- ◆ Form a complex within the shampoo soluble in the large excess of anionic surfactant present
- ◆ On dilution by application to wet hair the polymer is precipitated and adsorbed onto the hair with sufficient attraction to resist being lost at the rinse stage



# Shampoos & cationic polymers

- ◆ Cationic polymers with high molecular weight
- ◆ They do not need to have a high positive charge
- ◆ Molecular structure is important
- ◆ A branched polymer is more coiled than a linear polymer and therefore less hydrated in water-based formulations
- ◆ The polymer/surfactant complex is more readily precipitated and deposited on the hair upon dilution
- ◆ A coiled polymer is less strongly adsorbed on hair than a straight polymer and is easier to remove



# Shampoos & silicones

- ◆ Silicones are effective in reducing combing forces on dry and wet hair
- ◆ A very low level of silicone imparts a substantial improvement in combing performance
- ◆ Synergy between silicone and cationic guar
- ◆ Conditioning effect of silicone compounds in shampoos is dependent on high molecular weight
- ◆ It is essential to disperse the silicones uniformly within the product



# Select the correct silicone

- ◆ Cyclomethicones are volatile and may be added to shampoos to decrease drying time
- ◆ Dimethicone copolyols increase the wetting of hair while enhancing the foaming characteristics
  - because of their solubility, they may be used in clear systems
- ◆ Phenyl trimethicone has a high refractive index and gives added gloss to styling products



# Select the correct silicone

- ◆ Dimethicones are low surface tension liquids which form monolayer films over the hair shaft
  - imparting gloss, substantivity and soft feel
- ◆ Dimethiconols are high molecular weight silicone gums with excellent conditioning
  - need to be blended with a cyclomethicone or dimethicone to make them suitable for application
- ◆ Amodimethicones have polar amine groups with a strong affinity for hair
  - provide excellent dry and wet combing, along with softness, shine and static control



# Adding “body &/or volume”

Define the meaning!

- ◆ Thicken fine hair
  - Film formers
  - Increased moisture levels
  - Permanent waving
  - Absorption of hair dyes
- ◆ Add volume
  - Increase flyaway?



# Adding “body &/or volume”

- ◆ Materials that add body to hair may increase combing forces
- ◆ This increase may be used as an indicator of improved body and texture and of an ability to be more readily styled
- ◆ Treatments producing an increase of dry combing forces can actually contribute to better style stabilisation through increased inter fibre friction and consequently result in an enhancement of hair body

# The Conditioner

- ◆ Alkyl ammonium salt            1% to 8%
- ◆ Fatty Alcohol                    1% to 5%
- ◆ Special Additive                0.10% to 3%
- ◆ Additives
  - Proteins & amino acids
  - Panthenol, PVP, urea
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- ◆ Preservatives, colour, pH adjuster, perfume
- ◆ Water to 100%

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# The alkyl ammonium salt

Behentrimonium	Chloride / Methosulfate
Benzalkonium	Chloride
Cetrimonium	Bromide / Chloride / Methosulfate / Tosylate
Cocamidopropyl	Ethyldimonium Ethosulfate
Cocotrimonium	Chloride / Methosulfate
Stearalkonium	Chloride / Methosulfate



# Alkyl ammonium salt

Cocodimonium  
Hydroxypropyl  
Hydrolyzed

Casein / Collagen / Hair  
Keratin / Keratin / Rice  
Protein / Silk / Soy Protein  
/ Wheat Protein / Silk  
Amino Acids


Ricinoleamidopropyl-  
trimonium

Chloride / Methosulfate



# The fatty alcohol

Arachidyl Alcohol	Cetyl Alcohol
Behenyl Alcohol	Lauryl Alcohol
Caprylic Alcohol	Myristyl Alcohol
Cetearyl Alcohol	Stearyl Alcohol



# Preservatives, colour, pH adjusters, perfume

- ◆ The presence of the Quaternary ammonium salt reduces or even eliminates microbial problems
- ◆ It is generally agreed that an acid pH is beneficial to hair condition
- ◆ Perfume & colour are a matter of personal choice



# The additive

- ◆ Herbal extract to decorate the label
- ◆ Silicone for better gloss
- ◆ Ceramide coats the hair and improves combability
- ◆ Proteins & amino acids
- ◆ Panthenol and phytantriol

# Zenitech actives & additives

Zenibee Cream	Beeswax esters C14-C30
Zenicone WS-1X	Dimethicone Copolyol /PEG/PPG-10/2 Ricinoleate
Zenicone IX	PEG-8 Dimethicone /PEG/PPG-10/2 Ricinoleate
Zenigloss S	Castor Isostearate Succinate /Beeswax
Zenicone DMC-1	PEG-10 Dimethicone

# Zenitech actives & additives (2)

Zenigloss	Castor Isostearate Succininate
Zenigloss Q	Castor Isostearate Succininate/Ricinoleamidopropyl- trimonium Chloride
Zenigloss Q-SE	Castor Isostearate Succininate/PEG-2 Sorbitan Isostearate/Ricinoleamidopropyl- trimonium Chloride



# Zenigloss (Castor Isostearate Succininate)

- ◆ 0.50% added to an existing conditioner formula
  - it smoothed out the product so that it poured more evenly
- ◆ Salon trials reported a noticeable improvement in gloss
  - just 0.5% gave all the product improvement needed within price constraints



# Zenigloss Sheen Spray


Diethylhexyl Sebacate	38.00%
Cyclomethicone	40.00%
Castor Isostearate Succinate (Zenigloss)	20%
Perfume, UV absorber, vitamin E etc	qs

*Results: Spray giving high sheen & easy combing to hair*




# Zenigloss (Castor Isostearate Succininate)

- ◆ 0.50% added to shampoo
  - it dispersed to make creamy shampoo
- ◆ Foam stable & creamy & not depressed
- ◆ Salon trials report
  - creamy lather
  - noticeable improvement in gloss
  - manageable hair
  - good combability



# Zenigloss Q Castor Isostearate Succinate/Ricinoleamidopropyltrimonium Chloride

- ◆ 3% added to conditioner formula
- ◆ Salon trials report
  - easy application
  - rich texture
  - noticeable improvement in gloss
  - manageable hair
  - good wet & dry combability



# Zenigloss Q-SE Castor Isostearate Succinate/PEG-2 Sorbitan Isostearate/ Ricinoleamidopropyltrimonium Chloride

- ◆ 5% added to intensive conditioner formula
- ◆ Salon trials report
  - easy application
  - rich texture
  - good wet & dry combability
  - hair felt smooth & moisturised
  - outstanding gloss

# Flyaway



# Zenitechaway

