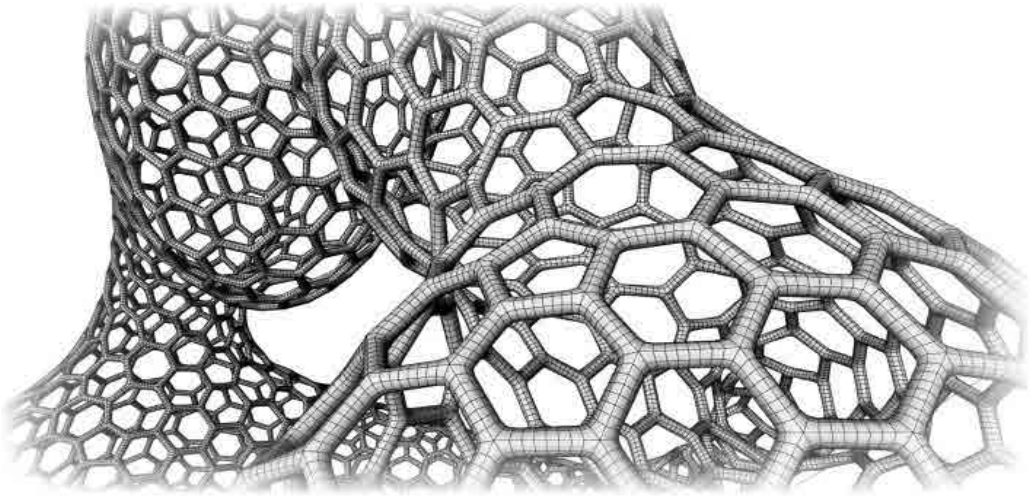
Active.Lite® Hair for Bleaching

Patent Pending: Application Number 62/289,493



Powerful Protection
Composite Particles
Natural
Strengthening
Hair Scaffolding
Selective Matrix

Code Number: 22045

INCI Name: Polyquaternium-80 & Water & Hydrolyzed Pea Protein & Selaginella Lepidophylla Extract
INCI Status: Approved
REACH Status: Complies
CAS Number: N/A & 7732-18-5 & 222400-29-5 & 90106-73-3
EINECS Number: N/A & 231-791-2 & N/A & 290-298-0
Origin: Botanical
Processing:
GMO Free
No Ethoxylation
No Irradiation
No Sulphonation
Additives:
Preservatives: None
Antioxidants: None
Other additives: None
Solvents Used: Water
Appearance: Clear to Slightly Hazy Semi-Viscous Liquid
Soluble/ Miscible: Water Soluble
100% Biodegradability
Microbial Count: < 100 opg, No Pathogens

Suggested Use Levels: Reference Formulation Guidelines on Page 5
Suggested Applications:
Hair Protection, Nourishing, Support

Benefits of **Active.Lite® Hair**

- Protects Hair
- Great for All Hair Types
- Provides Moisturization
- Strengthens Hair

BACKGROUND

Not all hair is created equal. In a perfect world, one would be born with the hair he/she wanted, but that's not typically the case. Whether it is curly, straight, frizzy, short, long or any number of styles, one thing holds true, change is desirable and damage is inevitable. Too often we find ourselves playing doctor, nurse, or even coroner to our hair. Dealing with damage post treatment is a thing of the past, preventative medicine is in, and now thanks to **Active.Lite® Hair**, so are preventative cosmetics.

Hair bleaching or dyeing leaves hair stripped, dry, and cracked; giving a "burnt" appearance. As the saying goes "appearances are everything", that is true for hair as well, "burnt" hair is weak and significantly prone to breakage. In science this property is referred to as Tensile, or ultimate strength which can be defined as the total stress a material can withstand while being stretched or pulled before failing or breaking. Guarding or even improving your hair's tensile strength has direct implications to its overall look and feel. **Active.Lite® Hair** was designed for this purpose with the additional benefit of providing the everyday moisturizing and nourishing care necessary for healthy, vibrant hair.

SCIENCE

The use of cationic polymers, peptides, and powerful moisturizing agents, make **Active.Lite® Hair** the entire package. Engineered, composite particles bring the idea of a multi-step and multi-level web of protection to life. **Active.Lite® Hair** is a chemically resilient material that ionically binds to the hair cuticle and offers long-term protection from harsh hair bleaches, free radicals, and peroxides, in addition to already nourishing the hair in the process. Due to hair's daily exposure to mechanical, thermal, and chemical stresses, designing a product for maximum protection required it to work under heavy pH stress and a level of stability never before seen. Similar to carbonate preventing

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acidosis of the blood and major tissue systems, proteins act as natural buffers to remove hydrogen radicals and balance pH. Amino acids, such as those common in *Pisum sativum,* can release hydrogen ions in alkaline environments, but also respond to acidity by binding excess hydrogen.

Film-forming properties are a popular claim in hair care, however this is boring and usually misleading. A film can loosely be defined as a thin layer of something, by that definition, water on the skin is a film. A bio-film is of much more interest; a polymeric chain forming a conglomeration of proteins, amino acids and polysaccharides that creates a complex, supporting, interwoven matrix. Alone, each substance has its benefit, but together, complex metabolic functions are kickstarted that play-on small scale biochemical interactions. A major benefit of the bio-film is its action as a scaffolding rather than a true barrier. Able to support and protect hair, this scaffolding allows small molecules and hydrogen ions in via its semi-permeable facade. It is this scaffolding and its semi-permeable membrane that promotes the exhibition of properties such as moisturization, pH balance, barrier protection, and additionally, protection from hair weakening after exposure to bleach and dyes.

BENEFITS

Designed to be effective in both salon grade and consumer available products, **Active.Lite® Hair** is a **must have** for any formulation. **Active.Lite® Hair** offers lasting protection, and chemical "burn" prevention to promote healthy cuticles.

Never before has a product been able to successfully protect hair whilst reducing pigmentation. Utilizing matrix style scaffolding and poly-compound reactions, this self-supporting, all-in-one, highly stable complex has propelled hair care into the next generation. Lighten your hair and your worries with **Active. Lite® Hair-** the ultimate side kick to bleach.

EFFICACY DATA

As shown in Figure 1, **Active.Lite® Hair** exhibits both visual and sensorial properties that are most commonly associated with healthy, vibrant hair, specifically when compared to untreated (bleach only) controls. This half-head salon study conducted by salon professionals demonstrates a clear difference in hair that has been treated, protected, and sealed using **Active.Lite® Hair**.

Please note that the concentration of bleach does not need to be changed in order to obtain the desired color; as is the case with the best things in life, sometimes less is more.

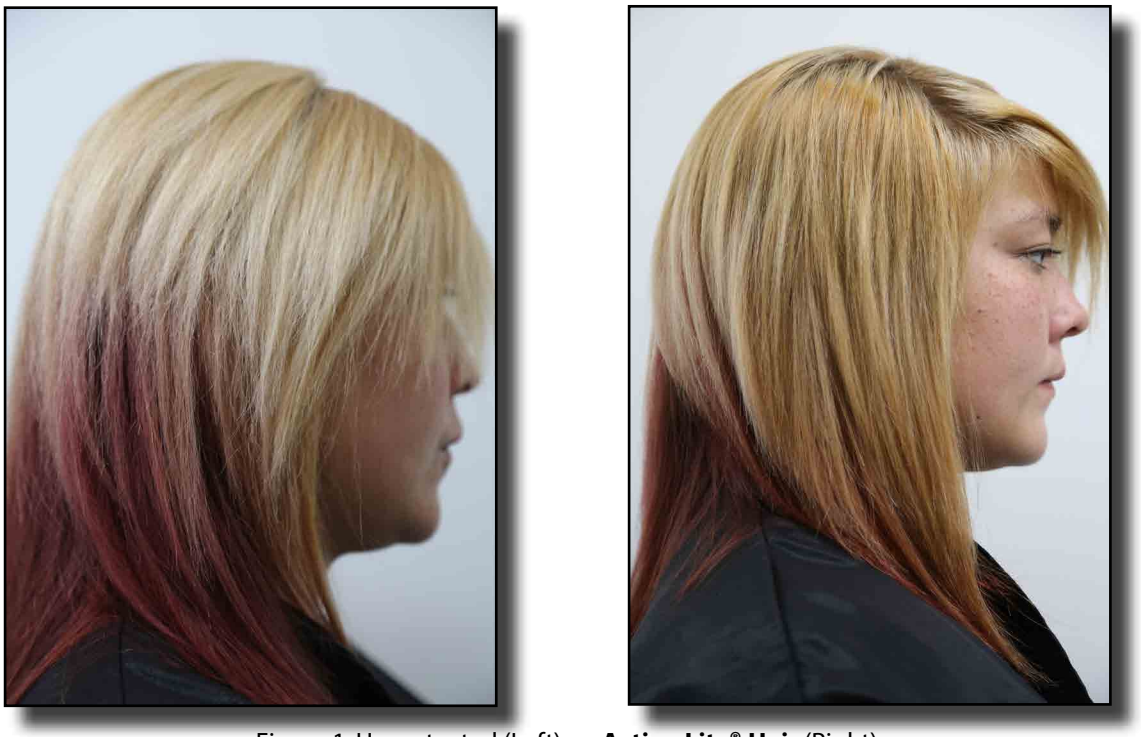

Figure 1. Unprotected (Left) vs. **Active.Lite® Hair** (Right)

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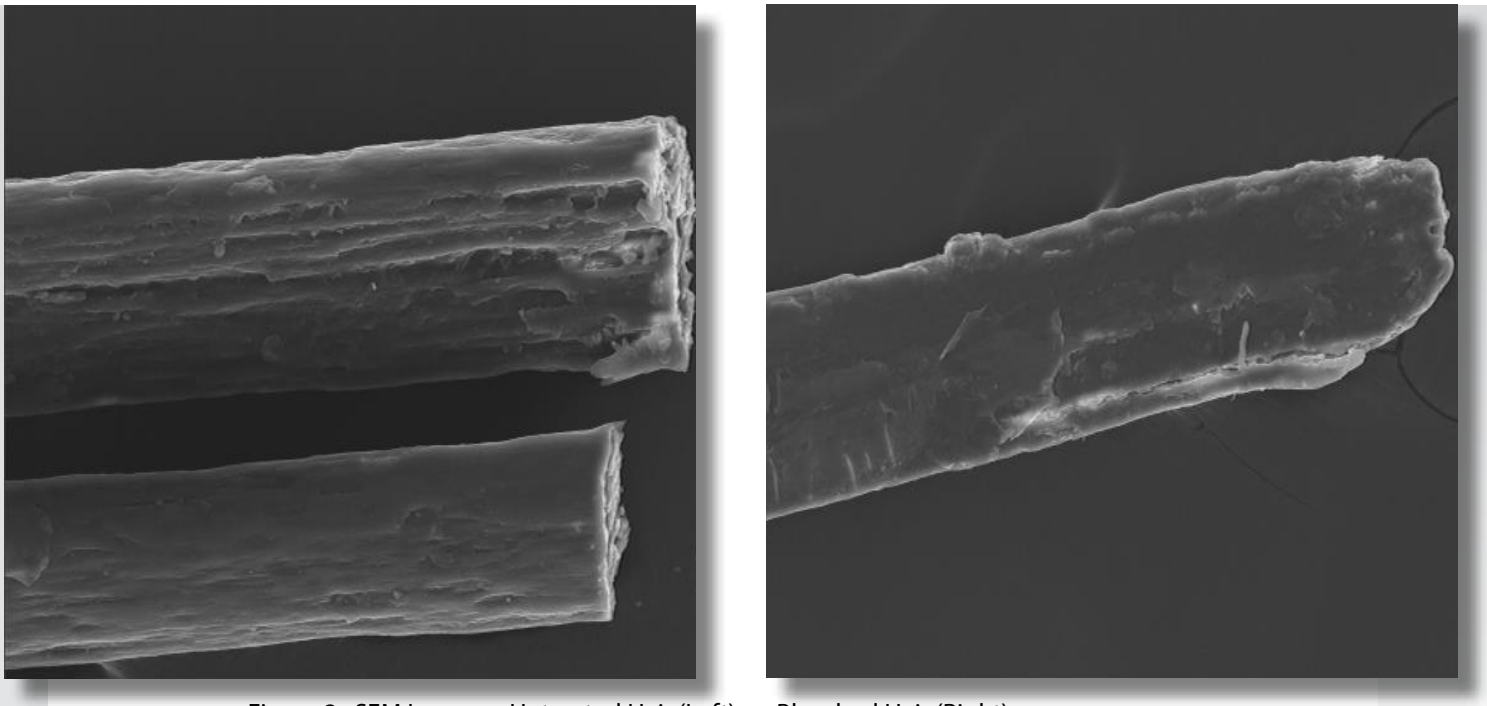

Figure 2. SEM Imagery, Untreated Hair (Left) vs. Bleached Hair (Right)

As seen in Figure 2, the Standard Electron Microscopy imaging demonstrates that, untreated hair is already prone to damage from everyday stressors, showing characteristic signs of breakdown. Results of bleaching the hair can be viewed on the right. The imagery results show more extensive damage to the hair fiber. This type of damage leads to irregular growth, breakages, and overall unhealthy or dead appearance. At a singular level, one cuticle may not seem important, but these strand to strand imperfections contribute to a much bigger picture of unhealthy and unprotected hair.

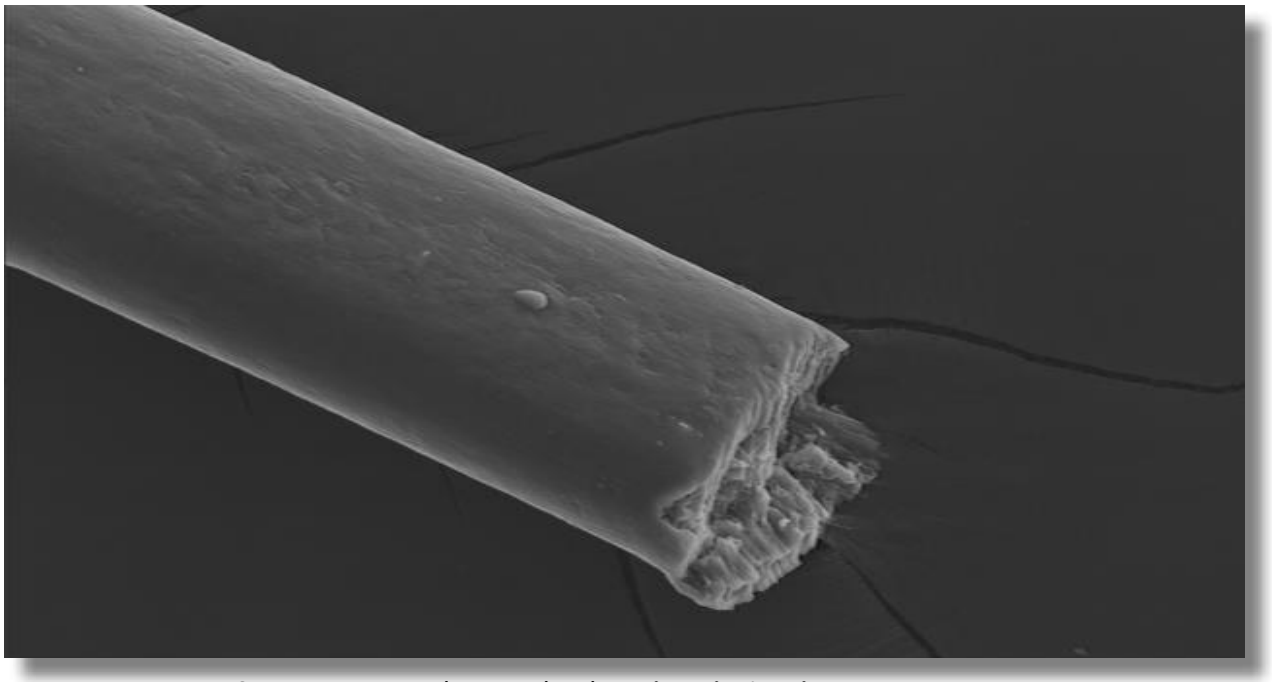

Figure 3. SEM Imagery, cuticle treated with **Active.Lite® Hair**

Treating hair with **Active.Lite® Hair**, as shown in Figure 3, makes a difference at the microscopic level, creating a scaffolding-like matrix to support hair while allowing the permeation of small molecules for hair bleaching. In Figure 2 the cuticle is clearly damaged whereas, in Figure 3 **Active.Lite® Hair** demonstrates its ability to protect each fiber by shielding the cuticle, leaving it beautifully smoothed and annealed, contributing to overall healthier looking, and feeling hair.

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Using an Instron (device for measuring mechanical properties) Active Concepts measured the absolute strength of individually treated hair fibers. As seen in Figure 4, hair treated with **Active.Lite® Hair** yielded no perceivable change to its elongation at break, an excellent indicator of overall strength. The trend remains the same as we increase the bleach concentration, although this increase in bleach is unnecessary, as **Active.Lite® Hair** achieves the same results, using less product. We can attribute this benefit to the complex's permeable scaffolding

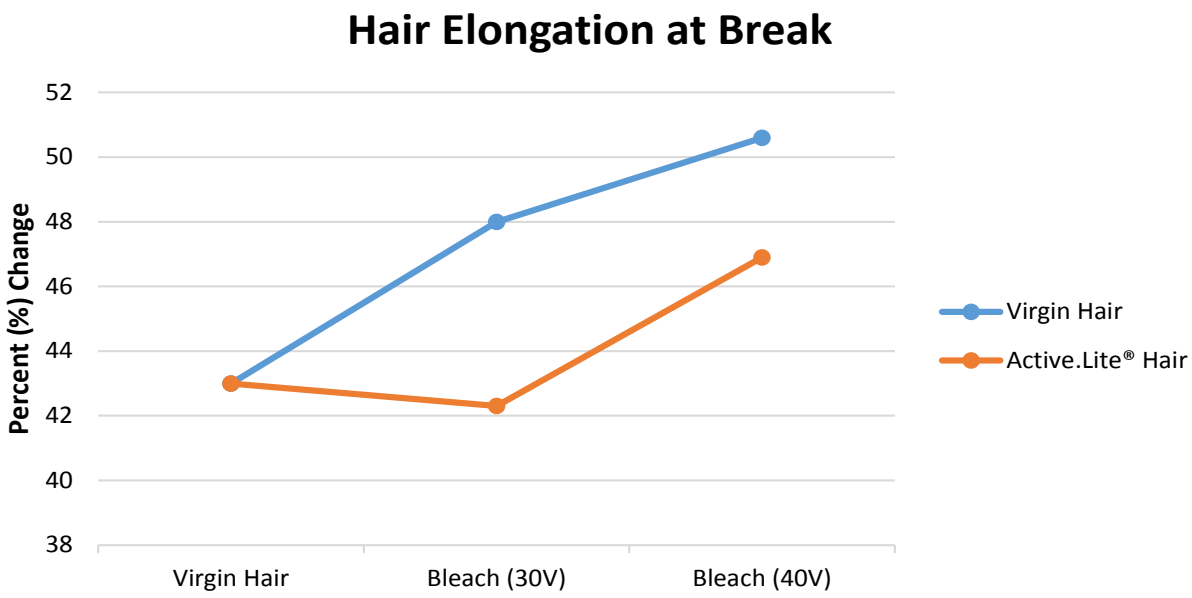


Figure 4. Elongation at Break/Strength

References

1) de Beer, D. et al. 2004. Journal of Biotechnology and Bioengineering. Effects of biofilm structures on oxygen distribution and mass transport. 43 (11): 1131-1138
2) Reeves, R. et al. 1976. Journal of Applied Physiology. Temperature-induced changes in blood acid-base status: pH and PCO2 in a binary buffer. 40(5): 752-761
3) Sano, H. et al. 1994. Journal of Dental Materials. Relationship between surface area for adhesion and tensile bond strength- evaluation of a micro-tensile bond test. 10(4): 236-240
4) Imai, T. et al. 2011. Okajimas Japan's Anatomic Journal. The influence of hair bleach on the ultrastructure of human hair with special reference to hair damage. 88(1): 1-9
5) Wolfram, J. et al 1970. Journal of the Society of Cosmetic Chemists. The Mechanism of Hair Bleaching. 21(1): 875-900

Formulating with Active.Lite® Hair

Active.Lite® Hair is an incredible, scientific breakthrough that is slated to shake the very foundation on which we've built preventative hair care. Below, various guidelines will help you achieve the best formulation/use results:

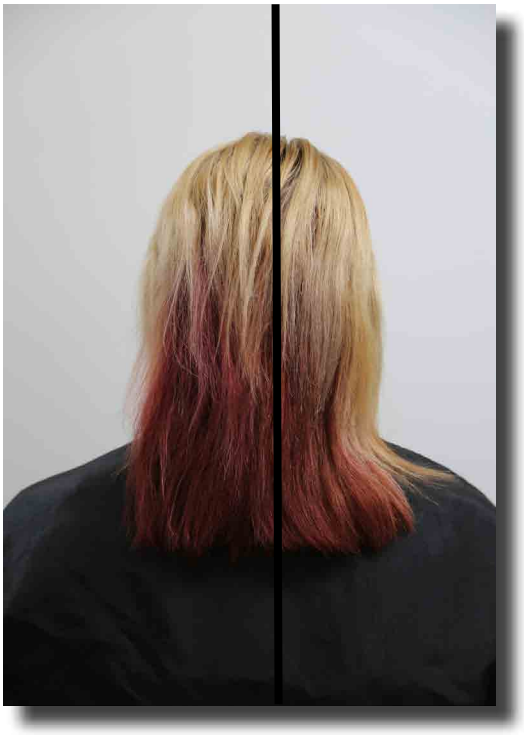
1) Measure 2.5% **Active.Lite® Hair** compared to DRY bleach powder
- Example: 1/2oz or less DRY bleach = 0.378g of **Active.Lite® Hair**
- Example: 1oz or more DRY bleach = 0.758g of **Active.Lite® Hair**

2) Measure approximately 25.0% water compared to dry bleach powder
- Example 1.0oz dry bleach (28.0 grams) = 6.4g of water
  - Add 3.2g of water for 1/2oz or less of DRY bleach powder
  - Add 6.4g of water for 1.0oz or more of DRY bleach powder

3) Combine **Active.Lite® Hair** from Step 1 and water measured from Step 2

4) Add developer to bleach powder to form desired consistency,
- If no benchmark exists "a butter cream" or "gravy" can be used as a target

5) Add the measured **Active.Lite® Hair** from Step 3 with bleach from step 4



Active.Lite® Hair can also be used in conditioners and Sealer!

Conditioners and sealers can be incorporated anywhere from 2.0-5.0% during the water phase of formulating.

THINGS TO NOTE:

This formulating guideline is strictly for Bleach Powder Lighteners.
Do NOT add **Active.Lite® Hair** to the dry bleach powder.
Follow aforementioned guidelines for optimal results.

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