AC Kerazyme®

all-natural
versatile styling options
curl retention + extended
hold on straight styles
enzyme technology,
heat protectant,
formaldehyde-free
modifies hair shape,
increases the hair's integrity

Code Number: 16594

INCI Name: Hydrolyzed Keratin & Trametes Versicolor Extract
INCI Status: Conforms
REACH Status: Complies
CAS Number: 69430-36-0 & 999999-99-4
EINECS Number: 274-001-1 & 310-127-6

Origin: Botanical & Animal
Processing:
GMO Free
No Ethoxylation
No Irradiation
No Sulphonation
Additives:
Preservatives: None
Antioxidants: None
Other additives: None
Solvents Used: Water
Appearance: Hazy, Yellow to Amber Viscous Liquid
Soluble/ Miscible: Water Soluble
Microbial Count: <100 CFU/g, No Pathogens

Suggested Use Levels: 1.0 – 10.0%
Suggested Applications: Temporary Straightening, Curling, Conditioning & Protecting

BACKGROUND

AC Kerazyme® is an all-natural, formaldehyde-free alternative to the hugely successful Brazilian Hair Straightener. Exposure to formaldehyde solutions raises health concerns and limits the user's styling options as this technology cannot enhance curl retention. Unlike formaldehyde-based hair straightening systems, **AC Kerazyme®** is capable of modifying hair shape while protecting it from styling damage.

Whether the desire is for smooth, straight hair or voluminous curls, consumers are interested in hair care products that improve ease of styling and shape retention. Active Concepts has pioneered a new enzyme technology which allows for either temporarily straight or curly hair. **AC Kerazyme®** not only delivers versatility at the customer's fingertips, but also reduces styling damage while providing further conditioning benefits. This innovative ingredient consists of a blend of hydrolyzed keratin and *Trametes versicolor* extract. *Trametes versicolor* is a type of mushroom which contains the enzyme laccase. This distinct, heat-activated enzyme cross-links free carboxylic acid groups in the hydrolyzed keratin with the amine groups along the cuticle to create a stable network that holds the hair's texture in a given shape. **AC Kerazyme®** also helps strengthen hair while protecting it from styling damage. The hydrolyzed keratin further enriches and conditions the hair to further optimize its integrity.

SCIENCE

Given the nature of the hair, it can be rather difficult to straighten or curl the hair for long periods of time without inflicting damage. This is because keratins found in hair are very strong and insoluble fibrous alpha-helical proteins. Although there are several different chemical bonds which affect the shape and texture of the hair, two important bonds to consider include hydrogen bonding between amide groups and the disulphide bridges.

Benefits of **AC Kerazyme®**

- Style Retention
- Heat Protection
- Temporary Straightening & Curling
- Conditioning
- Formaldehyde-Free Alternative

AC Kerazyme®

BENEFITS

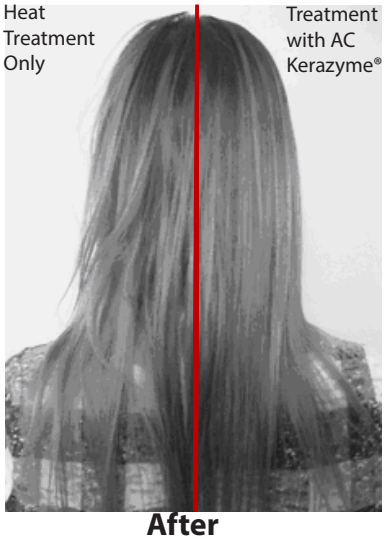
Styling tools such as hot irons or blow driers can be used to activate the botanical enzyme while simultaneously shaping the hair. This all natural technology provides versatility when it comes to styling and shape retention. Our research confirms that the benefits associated with **AC Kerazyme®** last until the hair is washed.

Whether looking to improve styling retention or protect hair from damage resulting from heat and physical forces, **AC Kerazyme®** is an ideal ingredient for use in a wide range of hair care applications. As an added benefit, the botanically derived enzyme and all natural ingredient coincides perfectly with trends for natural and NPA compliant products.

EFFICACY DATA

Half head studies indicate that **AC Kerazyme®** promotes ease of styling as only 1 to 2 passes with the flat iron are necessary to effectively straighten curly hair. In Figure 2, the side treated with **AC Kerazyme®** is clearly smoother, straighter and healthier looking than the side which did not receive any type of treatment prior to using the flat iron. This clearly indicates that **AC Kerazyme®** is ideal for easing the overall straightening process to achieve healthy and glamorous looking hair.

Before



After

Figures 1 & 2. Half-head before and after images of hair treated with **AC Kerazyme®**

AC Kerazyme® also helps strengthen hair while protecting it from styling damage. The enzyme is capable of annealing disulphide bonds which help enhance hair strength. The hydrolyzed keratin further enriches and conditions the hair to further optimize its integrity. These benefits are clearly illustrated by the Scanning Electron Microscopy (SEM) images included in Figures 3-8. In this study, real life conditions were mimicked by subjecting hair swatches to daily hair treatment rituals which included washing and combing the hair as well as using a blow drier and flat iron at 380 - 400°F (193 - 204°C) to style the hair. This treatment cycle was repeated 30 times to simulate styling damage over the course of one month.

For comparison, SEM images were also taken of virgin undamaged hair. The images shown in Figures 3 and 4, of hair subjected to the styling protocol but not pretreated with product clearly showed signs of damage as is evident by the visible cuticle degradation. The bright white areas are also points where structural damage has occurred. However the SEM images (Figure 5 and 6) of the hair pretreated with 2.0% **AC Kerazyme®** appears smooth and healthy with very few visible points of damage.

AC Kerazyme®

In fact, the images of hair treated with **AC Kerazyme®** look very similar to the SEM images of virgin untreated hair. These findings confirm that **AC Kerazyme®** is capable of delivering strong protective benefits which will help to minimize damage that typically results from regular washing and styling regimens.

In order to maintain optimal enzyme activity, **AC Kerazyme®** should be incorporated into a formulation during the cooling phase or at temperatures below 70°C. For better results, we recommend using this material in leave-on applications such as conditioners, creams and serums.

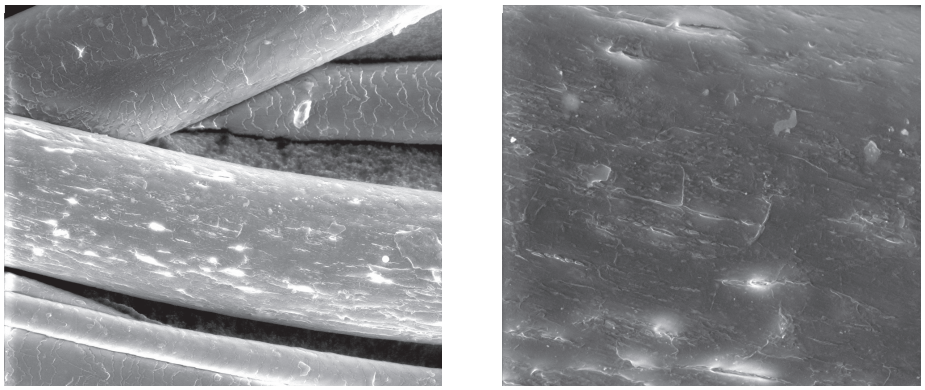


Figure 3 & 4. SEM Images of tress 3, processed hair left untreated as a control

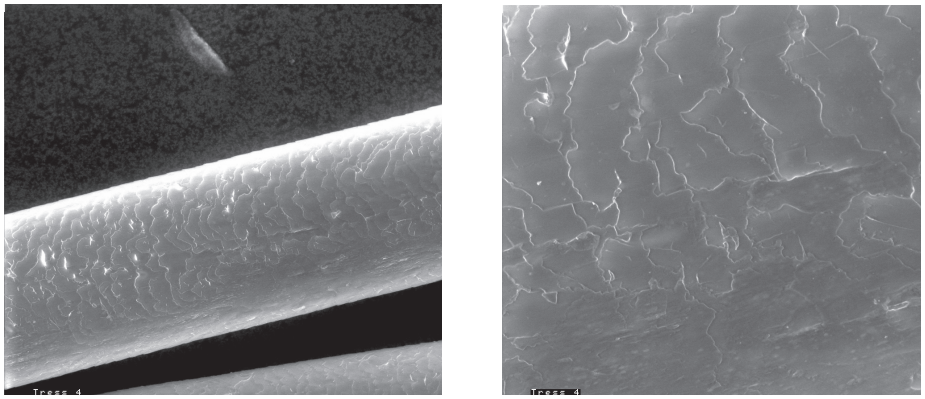


Figure 5 & 6. SEM images for tress 4, processed hair treated with 2.0% **AC Kerazyme®**

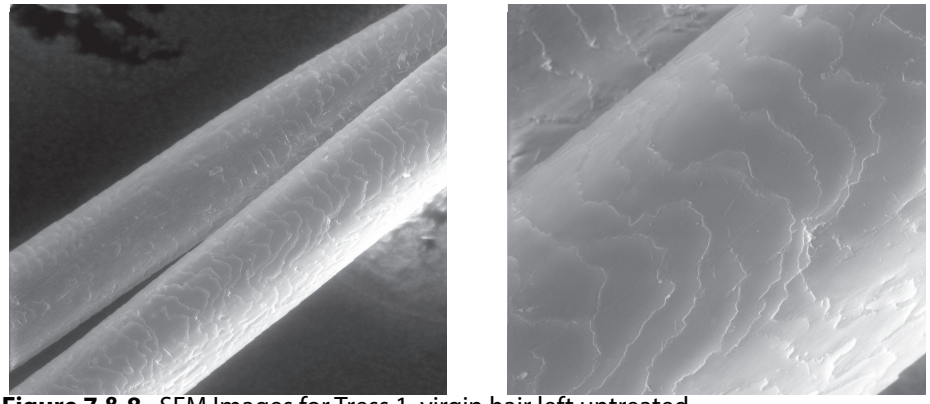


Figure 7 & 8. SEM Images for Tress 1, virgin hair left untreated.

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