

16594.

AC Kerazyme®

PROTEINS



EX VIVO



IN VITRO



CHINA



ISO 16128



THE FEATURES.

AC Kerazyme® is a rejuvenating, water-soluble ingredient perfectly suited for cosmetic formulators searching for an ingredient that offers unbeatable protection. Bolstering the bioactive compounds available in turkey tail mushrooms and amino acid compositions of hydrolyzed keratin, AC Kerazyme® provides antioxidant and heat styling protection. This innovative complex is an ideal ingredient for a wide range of skin and hair products, enhancing hair softness and reducing free radical damage. AC Kerazyme® infuses turkey tail mushroom and hydrolyzed keratin to elevate a variety of cosmetic and personal care formulations.

Hydrolyzed Keratin & Trametes Versicolor Extract

Actions

Antioxidant
Heat Protectant
Conditioning
Nourishing

TECHNICAL DATA SHEET.

THE REGULATION.

INCI. Hydrolyzed Keratin & Trametes Versicolor Extract
CAS. 69430-36-0 & 999999-99-4
EINECS. 274-001-1 & 310-127-6
EUROPE. Compliant
USA. Compliant
CHINA. Compliant

THE SPECIFICATION.

Origin. Animal/Botanical/Bacteria
Natural Antimicrobial. Leuconostoc/Radish Root Ferment Filtrate*
Preservatives. None
Solvents Used. None
Soluble/Miscible. Water Soluble
Appearance. Hazy Viscous Liquid, Yellow to Amber
Use Level. 1- 10 %

* Please note this product contains Leuconostoc/Radish Root Ferment Filtrate (Tradename: M15008-Leucidal® Liquid) - produced by Active Micro Technologies, LLC - containing 18.0–22.0% Phenolics (tested as Salicylic Acid). Please refer Leucidal® Liquid product literature for additional information.



THE STORY.

Skin and hair, based on outward appearances, are as different as night and day. It may be surprising to know that a major component of your skin, hair, and even your fingernails is the same material: keratin. Keratin is a structural protein that does not soften in hot or cold water and is not susceptible to proteolysis. However, repeated exposure of skin and hair to soaps, chemicals, hard water and harsh weather can cause dryness, which can lead to more significant detrimental effects such as roughness, scaling, dullness and eventual breakage. The high natural protein content in skin and hair makes proteins valuable for various cosmetic uses, but their poor water solubility limits their direct application. To be useful in cosmetics, proteins must be hydrolyzed into smaller peptides or amino acids. Hydrolyzed proteins play an important and functional role in keeping our skin and hair moisturized and healthy.

Edible mushrooms have been consumed for thousands of years, as they have a history of use in traditional medicine dating back to ancient civilizations like China, Rome, and Greece. *Trametes versicolor*, commonly known as the turkey tail mushroom, have gained significant attention in the cosmetic industry for its rich array of antioxidant properties. As consumers increasingly seek natural and sustainable ingredients, turkey tail mushroom has become a popular choice in skincare formulations, touted for its potential to enhance skin and hair health and promote a youthful appearance. Its cultural significance is also growing, as brands emphasize traditional uses in herbal medicine, reflecting a broader shift towards holistic wellness. Combining the power of turkey tail mushroom and hydrolyzed keratin, AC Kerazyme® is the perfect solution for protection from antioxidants and heat styling!

THE SCIENCE.

The keratin that makes up hair strands is made up of disulfide bonds, which are links that help to make the hair strong and flexible.¹ Because of these bonds, hair fibers are sturdy and can hold their shape well. Research has shown that heat styling at high temperatures can lead to water loss and a replacement of weaker hydrogen bonds with stronger ionic bonds.² This process impacts both the ordered (crystalline) and unordered (amorphous) areas of the hair's inner cortex, leading to damage in the hair's structure. Hydrolyzed keratin exhibits a chemical structure analogous to that of human keratin, characterized by a reduced molecular weight; this composition facilitates the retention of softness and shine in healthy hair.²

When exposed to UV radiation or environmental pollutants, free radicals can accumulate on the skin and hair and lead to lipid oxidation, inflammation, and damage to otherwise healthy cells.¹ Free radicals are highly reactive, but antioxidants can prevent oxidation by scavenging free radicals.² Research has shown that both hydrolyzed keratin and turkey tail mushroom provide free radical scavenging abilities, allowing for potent antioxidant protection for both the skin and the hair. In turkey tail mushroom, the antioxidant capabilities can be attributed to the bioactive compounds that make up the botanical, including flavonoids, hydroxybenzoic acids, hydroxycinnamic acids, and coumarins.³ In nature, plants produce these primary and secondary metabolites as a survival mechanism against UV light exposure.³ Hydrolyzed keratin provides antioxidant protection primarily due to its amino acid composition.¹ When keratin is hydrolyzed, it breaks down into smaller peptides and amino acids, which can help neutralize free radicals and reduce oxidative stress in hair and skin.¹

THE BENEFITS.

Skin

Antioxidant Oxygen Radical Absorbance Capacity (ORAC) Assay



Hair

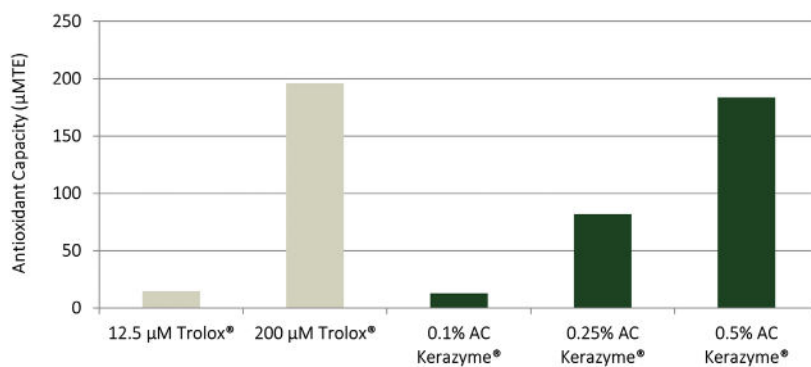
Heat Protectant Heat Protection Scanning Electron Microscopy (SEM) Imaging



THE EFFICACY.

ORAC Assay.

An *in vitro* Oxygen Radical Absorbance Capacity (ORAC) Assay was conducted to assess the antioxidant capacity of AC Kerazyme®. Peroxyl radicals were generated from the thermal decomposition of 2,2'-azobis-2-methyl-propanimidamide dihydrochloride (AAPH) on the signal intensity from the fluorescent probe in the presence of an oxygen radical absorbing substance. Trolox®, a water soluble Vitamin E analog, with known antioxidant capabilities was used in this ORAC Assay as the standard for measuring the antioxidant capacity of unknown substances.



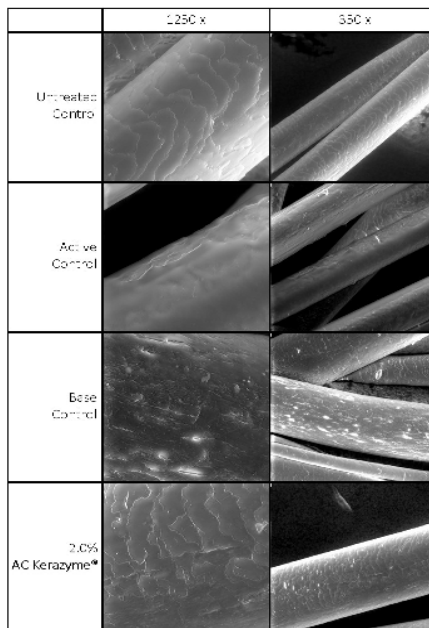
Exhibited comparable activity to 200 µM Trolox®. (at 0.5%)

Antioxidant.

Free radical quenching abilities & Cellular protection

Heat Protection SEM Assay.

An *ex vivo* Heat Protection Scanning Electron Microscopy (SEM) Assay was conducted to visually assess the ability of AC Kerazyme® to protect hair against heat styling. One tress was treated with 2.0% AC Kerazyme® in water one time as an Active Control to demonstrate how the product interacts with hair. Two tresses were washed with Base Shampoo and allowed to fully air dry before heat styling. While damp, the experimental tress received 2.0% AC Kerazyme® in water as a leave-in application. An Untreated Control tress was left unaltered. The Base Control and 2.0% AC Kerazyme® treated tresses were brushed five times and then heat styled using 10 passes of a hair straightener set to the highest setting of 450°F. This protocol was repeated 29 times for the two washed tresses.



Protects and strengthens virgin brunette hair against repeated washing and thermal induced damage. (at 2.0%)

Cuticle Protection.

Heat + Barrier Protection & Smoothing

References:

1. Matyášovský, J., et al. "Antioxidant Activity of Keratin Hydrolysates Studied by DSC." JALCA. 114 (2019): 20-28.
2. Daniels, G., et al. "An ex vivo Comparison of the Tensile-Strengthening Properties of Protein Derivatives on Damaged Hair." International Federation of Societies in Cosmetic Chemists. 3 (2016): 1-6
3. Kršmanović, N., et al. "Effects of UV Stress in Promoting Antioxidant Activities in Fungal Species Trametes versicolor (L.) Lloyd and Flammulina velutipes (Curtis) Singer." Antioxidants. 12.2 (2023): 302.

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