Humidity Protection Analysis

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Tradename: AC Curezyme

Code: 20562

CAS #: 100209-45-8

Test Request Form #: 12781

Lot: N250131A

Sponsor: *Active Concepts, LLC; 107 Technology Drive Lincolnton, NC 28092*
Study Director: *Daniel Shill*
Principal Investigator: *Hannah Stade*

Test Performed:
Humidity Protection Analysis

Introduction

A bio-film's action as a scaffolding rather than a true barrier means it can 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 thermal processes. We can see the actions of these bio-films through humidity protection resulting in smoother and well maintained hair tresses with less frizz.

Accordingly, a Humidity Protection Analysis was performed to qualitatively assess the humidity protection capabilities of **AC Curezyme** on hair.

Assay Principle

Human hair tresses were tested to understand the protective capability of a cosmetic product. Tress images are obtained after testing material application and after exposure to humidity. After treatment, qualitative analysis of images was conducted.

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Materials

A. Hair Samples: Human Virgin Brunette, Bleached Blonde, and Curly Hair Tresses
B. Incubation Conditions: Average 28°C; Average 93% Relative Humidity
C. Equipment: HOBO Onset temp/RH logger; Canon EOS Rebel Digital Camera

Methods

Twelve hair tresses (four bleached blonde, four virgin brunette, and four curly) were collected and treated with DI Water, 2.0% **AC Curezyme**, or left as a Negative Control. An Untreated Control was left untreated and was not subjected to humidity. Each hair tress was evenly soaked in its designated treatment and blown dry. Initial images were taken after treatment and drying. The hair tresses were then fastened to the lid of the humidity chamber, allowing a natural hanging position and space in between each tress. A 2000 mL beaker of boiling water was placed into the chamber and the lid secured creating a closed, controlled environment. The temperature and humidity were monitored for the duration of the exposure. Final images were taken after 30 minutes of humidity exposure.

Table 1. Descriptions of the Conditions and Treatments for each Hair Tress

Condition	Treatment Description
Untreated Control	No Treatment, No Humidity
Negative Control	No Treatment, Humidity
DI Water	Water Soak, Humidity
2.0% **AC Curezyme**	2.0% **AC Curezyme** in Water Soak, Humidity

Results

The data obtained from this study met criteria for a valid assay and the Untreated and Negative Controls performed as anticipated. Compared to the Negative Control, the tress treated with DI Water had a similar appearance and did not reduce frizz. The tresses treated with 2.0% **AC Curezyme** provided hair humidity protection and reduced development of frizz compared to the Negative Control and hair treated with DI Water.

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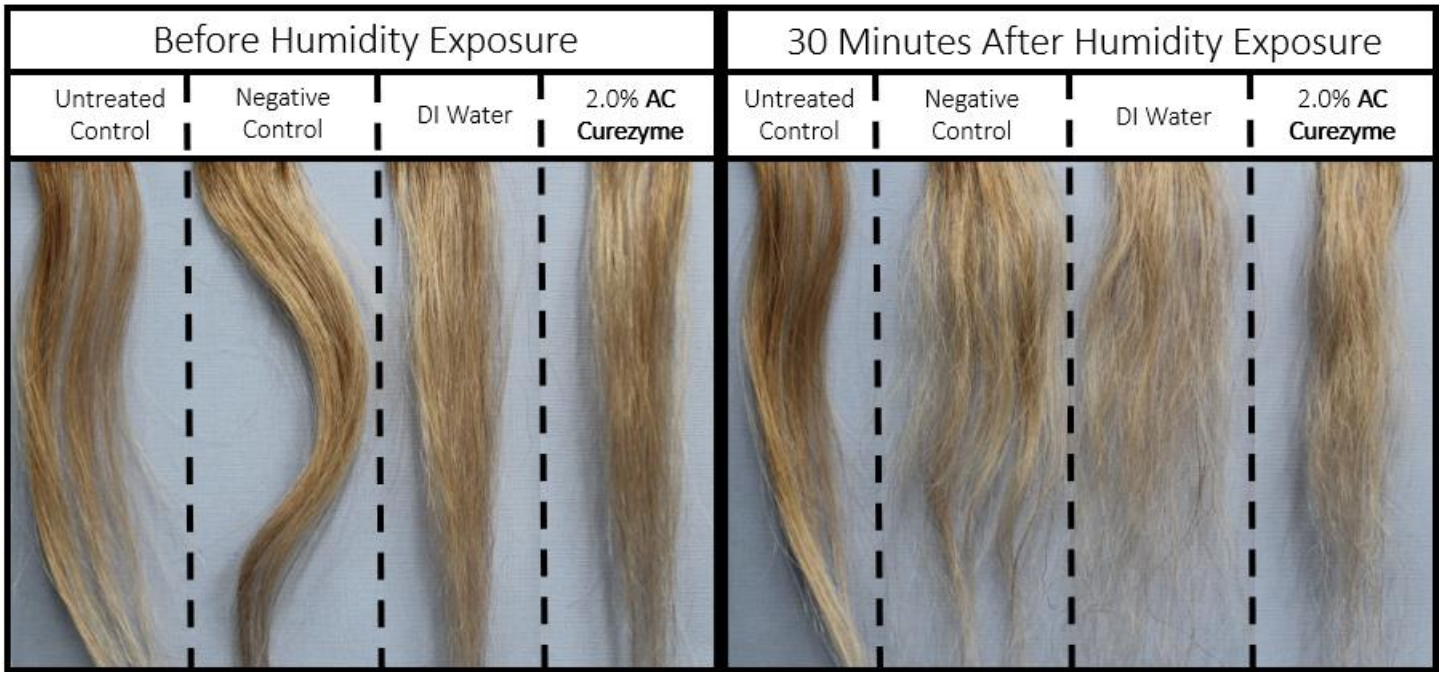

Figure 1. Before and 30 Minutes After Humidity Exposure in Bleached Hair Tresses

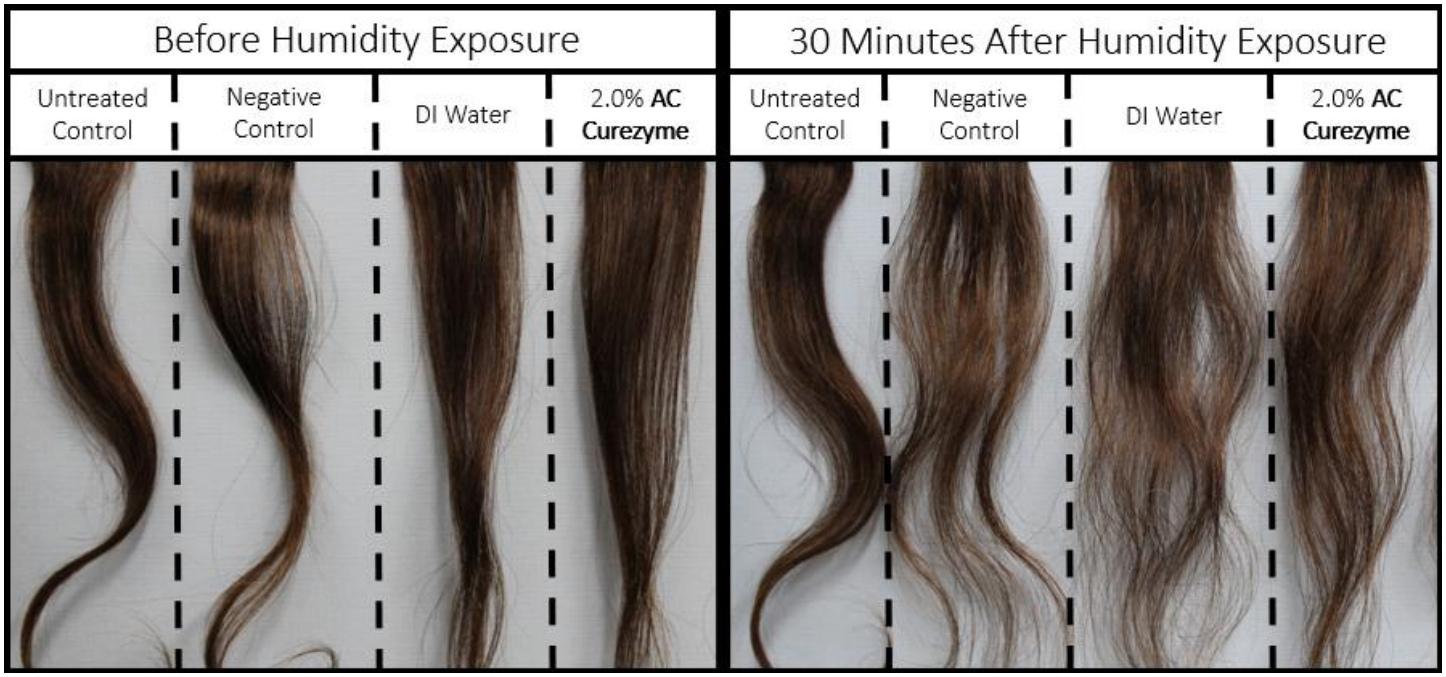

Figure 2. Before and 30 Minutes After Humidity Exposure in Virgin Brunette Hair Tresses

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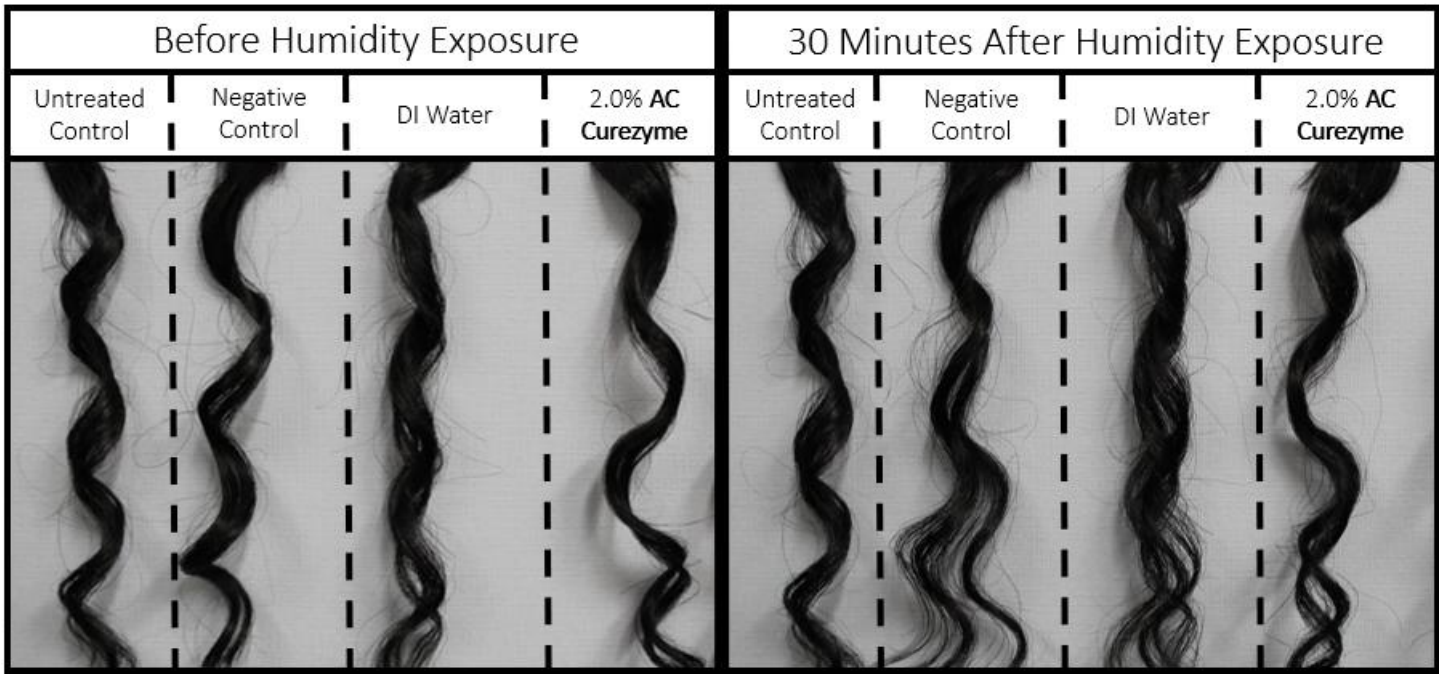

Figure 3. Before and 30 Minutes After Humidity Exposure in Curly Hair Tresses

Discussion

A qualitative study was performed to determine the humidity protecting ability of **AC Curezyme** in hair tresses.

As shown in Figure 1, both the Bleached Negative Control and DI Water hair tresses were extremely frizzy after humidity exposure compared to the Untreated Control. Conversely, the bleach blonde hair tress treated with 2.0% **AC Curezyme** exhibited a smooth and shiny appearance compared to the Negative Control and DI Water. This data indicates **AC Curezyme** exerts superior humidity protection with chemically treated blonde hair compared to water alone.

With respect to virgin brunette hair, the Negative Control and DI Water tresses were also extremely frizzy after humidity exposure compared to the Untreated Control (Figure 2). Conversely, 2.0% **AC Curezyme** protected the virgin brunette hair and the tresses appeared smooth and shiny compared to the Negative Control and DI Water. This data indicates **AC Curezyme** exerts augmented humidity protection with virgin brunette hair compared to water alone.

Finally, the curly hair Negative Control and DI Water tresses were also extremely frizzy and lost curl definition after humidity exposure compared to the Untreated Control (Figure 3). Conversely, 2.0% **AC Curezyme** protected the curly hair and the tresses appeared smooth while retaining their curl pattern compared to the Negative Control and DI Water. This data indicates **AC Curezyme** exerts augmented humidity protection with curly hair compared to water alone.

Taken together, these results indicate **AC Curezyme** reduces the volume and frizz produced by humidity and protects natural curl patterns when added to personal care applications at recommended use levels. Collectively, **AC Curezyme** smooths and protects both chemical treated and virgin hair reducing the visual consequences of humidity exposure.