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Tradename: ProCutiGen® Bond

Code: 20829

CAS #: 93384-40-8 & 1686112-10-6 (or) 84775-94-0 (or) 9015-54-7

Test Request Form #: 6759

Lot #: 75376P

Sponsor: Active Concepts, LLC; 107 Technology Drive Lincolnton, NC 28092 **Study Director:** Maureen Danaher **Principle Investigator:** Parisa Mehrzadeh

Test Performed: Hydrogen Peroxide Stability via Infrared Spectroscopy

Assay Principle

This study was conducted to demonstrate that the addition of **ProCutiGen® Bond** does not neutralize the peroxide in a developer solution, indicating its ability to effectively work in systems designed to lighten or lift the hair. Fourier-transform infrared spectroscopy (FTIR) measures the wavelength and intensity of infrared light absorption and provides information on the chemical identity of a sample. The use of such instrumentation can confirm whether certain functional groups, structures, or bonds are present in a particular sample. This assay compares FTIR spectra collected from solutions of **ProCutiGen® Bond** at different time points to determine if there are any peak changes over time.

Materials

- A. Equipment: Shimadzu IRSpirit Fourier Transform Infrared (FTIR) Spectrophotometer, QATR-S
- B. Reagents: Deionized Water; Hydrogen Peroxide (H₂O₂)
- C. Other: Disposable pipettes

Methods

Two solutions were made as follows:

- 1. 2% ProCutiGen® Bond + Deionized Water
- 2. 2% ProCutiGen[®] Bond + 10% H₂O₂ + Deionized Water

The samples were analyzed individually on the Shimadzu FTIR with the QATR-S accessory. Scans were analyzed for a stabilization of O-H stretching and deformation, characteristic of H_2O_2





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Results

The figures below demonstrate that **ProCutiGen[®] Bond** is able to maintain its integrity in the presence of hydrogen peroxide, and does not undergo any degradation over time.



Figure 1. 2.0% ProCutiGen[®] Bond + Water (Top) vs 2.0% ProCutiGen[®] Bond + 10.0% H₂O₂ (Bottom) at Time of Manufacture.



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Figure 2. 2.0% ProCutiGen[®] Bond + Water (Top) vs 2.0% ProCutiGen[®] Bond + 10.0% H₂O₂ (Bottom) at T=5 hours.



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Figure 3. 2.0% ProCutiGen[®] Bond + Water vs 2.0% ProCutiGen[®] Bond + 10.0% H₂O₂ (Bottom) at T= 24 hours.





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Discussion

As the FTIR spectra show in Figures 1-3, 2.0% **ProCutiGen® Bond** does not undergo H_2O_2 degredation over time. The peaks represented between 2930–2680 cm⁻¹ and 1530–1260 cm⁻¹ indicate O–H stretching and O–H deformation vibrations, respectively, and are characteristic of H_2O_2 solutions.¹

At all tested time points, these distinguished peaks remain consistent in solution with **ProCutiGen® Bond**, and conversely validates that this material does not degrade nor neutrialize H_2O_2 . There were no changes in wavelength or peak intensity at T=0, T=5, and T=24 hours. The results indicate that **ProCutiGen® Bond** does not degrade in the presence of H_2O_2 even with time, and is an appropriate addition to a developer solution or system intended to lighten or lift the hair.

References:

 Voraberger, Hannes & Ribitsch, Volker & Janotta, Markus & Mizaikoff, Boris. (2003). Application of Mid-Infrared Spectroscopy: Measuring Hydrogen Peroxide Concentrations in Bleaching Baths. Applied spectroscopy. 57. 574-9.