**Floraesters® K-20W Jojoba Improved Color Retention in a Semi-Permanent Hair Dye**

**Objective:**
To evaluate Floraesters K-20W Jojoba in a semi-permanent hair dye for its potential to increase the color that remained on the hair after washing.

**Method:**
Hair tresses were dyed with brown semi-permanent hair dyes with and without 2% Floraesters K-20W Jojoba. The change in color (ΔE) of the hair tresses was measured immediately after dyeing, and again after 3 and 6 wash cycles.

**Results:**
Hair tresses dyed with semi-permanent hair dye containing 2% Floraesters K-20W Jojoba resulted in up to 53% less color loss after 6 wash cycles.

**Floratech Ingredient: Floraesters K-20W Jojoba**

The ex vivo study of Floratech test formulation (CTL_15-062) was conducted on naturally curly, dark brown, six inch long hair tresses (DeMeo Brothers Inc.) that were double-bleached and then washed with sodium lauryl sulfate prior to use in the study (n=5 tresses per test article), then air-dried overnight. Treatment consisted of one application of 1 ml of the dye test article per 1.5 g of hair, with 20 minutes of residence time (with heat). A wash cycle consisted of a 30 second rinse, a 30 second wash (i.e. rubbed) with shampoo, and another 30 second rinse. The study was blinded, and carried out under controlled temperature and humidity conditions. Color change was calculated from L* a* b* values using the following equation: 

\[
\Delta E = \sqrt{\left[L_0^* - L^*\right]^2 + \left(a_0^* - a^*\right)^2 + \left(b_0^* - b^*\right)^2}
\]

The inclusion of Floraesters K-20W Jojoba resulted in statistically significantly (p<0.05) less color loss after 6 washes compared to the vehicle. (Clinical Study 15-062 - Phase II - Brown report available upon request.)

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