Self-Tanning Formulations are Improved with the Addition of Floraesters K-20W Jojoba

Presented by: Tiffany N. Oliphant, M.S., C.C.R.C.
and Robert A. Harper, Ph.D.

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Tiffany N. Oliphant, M.S., C.C.R.C. (Floratech, Chandler, AZ) and Robert A. Harper Ph.D. (Harper & Associates, La Jolla, CA)

Email: sales@floratech.com Website: www.floratech.com

Abstract

Data from multiple, pilot, clinical studies have shown that Floraesters K-20W Jojoba (K-20W) enhances the efficacy and sensory properties of multiple finished cosmetic and personal care formulations. For example, K-20W in combination with glycerin enhances skin moisturization; sunscreen actives in combination with K-20W are retained on the skin after water immersion; and some fragrances are retained on the skin longer in the presence of K-20W. Theoretically, the activity is due to the film-forming ability of the K-20W. In addition to these studies we now show that K-20W can also prolong the artificial skin color produced by a sunless tanner (i.e. self-tanner), while also improving its sensory appeal to consumers.

In a small, double-blind, vehicle-controlled, clinical study, subjects' backs were treated with one application of several sunless tanner formulations, all containing 5% DHA. Formulations varied with regard to pH and the amount of K-20W, acrylates/octylacrylamide copolymer, and erythrulose. Skin color and moisturization measurements were taken before treatment, and 24, 48, 72, and 96 hours after treatment. Test articles containing K-20W (at 1%), or a combination of K-20W and erythrulose (at 0.5-1%), produced the greatest percent increase and retention of skin color (p<0.05 compared to the vehicle) at all time points. Test articles containing K-20W also produced higher levels of skin moisturization 24 hours after test article application. Test articles with and without 0.5% K-20W were also evaluated in consumer preference studies on the legs with repeat applications. Consumers preferred the formulations that contained K-20W for evenness of tan, longevity of tan, moisturization, odor, and overall preference. These results show that the addition of Floraesters K-20W Jojoba into sunless Tanner formulations can enhance the effectiveness of these safe alternatives to sun exposure.

References / Footnotes

1. Dihydroxyacetone (DHA) was supplied by EMD Chemicals Inc.
2. Dihydroxyacetone (DHA) was supplied by Akzo Nobel Chemicals.
4. The pH of the test articles was adjusted using citric acid or sodium hydroxide. Dihydroxyacetone and methods to improve its performance as artificial tanner. The Open Dermatology Journal. 3: 42-43. 2009.
6. C. G. B. and C. N. B. Diacrylate 79 (INCI: acrylates/octylacrylamide copolymer) is a film-forming polymer used to maintain active ingredients at the site of application.
7. D. B. E. Dihydroxyacetone was supplied by Akzo Nobel Chemicals.
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Enhanced Consumer Preference

Objective: To determine the consumer preference between a sunless tanning formulation with and without Floraesters K-20W Jojoba.

Design: Randomized daily applications (2.5 mg/cm²) of two sunless tanner formulations, for three days, to the outer lower legs of 27 female subjects.

End Point: A consumer preference survey was completed on Day 3 for immediately observable skin and product properties and on Day 7 for long-term properties.

**Figure 3: Product Characteristics**

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smell of Product</td>
<td>3</td>
</tr>
<tr>
<td>Spreadability</td>
<td>3</td>
</tr>
<tr>
<td>Slide Across Skin</td>
<td>3</td>
</tr>
<tr>
<td>Rinse-Off (hands)</td>
<td>3</td>
</tr>
<tr>
<td>Moisturization</td>
<td>3</td>
</tr>
<tr>
<td>Overall Product Preference</td>
<td>7</td>
</tr>
<tr>
<td>Overall Color</td>
<td>7</td>
</tr>
<tr>
<td>Evenness of Tan</td>
<td>7</td>
</tr>
<tr>
<td>Longevity of Tan</td>
<td>7</td>
</tr>
<tr>
<td>Overall Tanning Experience</td>
<td>7</td>
</tr>
</tbody>
</table>

**Figure 4: Skin Characteristics**

Figure 3 and 4. The sunless tanner formulation with Floraesters K-20W Jojoba was preferred by consumers over the vehicle test article.

Conclusions

- Floraesters K-20W Jojoba increased skin color retention when incorporated into a sunless tanning formulation.
- Floraesters K-20W Jojoba increased skin hydration when incorporated into a sunless tanning formulation.
- 80% of consumers preferred the smell of the sunless tanning formulation with Floraesters K-20W Jojoba.
- Floraesters K-20W Jojoba increased consumer perception when incorporated into a sunless tanning formulation.
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