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

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 probe 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, subject’s backs were treated with one application of several sunless Tanner formulations, containing 5% DHA.1 Formulations varied with regard to pH and the amount of K-20W, acrylates/octylacrylamide copolymer2 and erythrulose.3 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, moisturization, odor, and overall preference. These results show that K-20W can also prolong the artificial skin color produced by a sunless Tanner.

**Background Information**

- Floraesters K-20W Jojoba (NCI: Hydroxy-stearic Jojoba Ester) and Water (Aqua) is composed of 20% hydrogenated jojoba esters and 80% water. Hydrogenated jojoba esters are derived from jojoba (Simmondsia chinensis) seed oil.
- Dihydroxyacetone is utilized within sunless tanner formulations at 3-5%.
- Erythrulose is also a sugar used in sunless tanning formulations. It utilizes the same mechanism as DHA, however the reaction occurs more slowly thereby extending the life of the tan.
- Dermacryl-79 (NCI: acrylates/octylacrylamide copolymer) is a film-forming polymer used to maintain active ingredients at the site of application.4

**References/Notes**

1 Dihydroxyacetone (DHA) was supplied by Sigma Chemicals, St. Louis, MO. 2 Acrylates-Octylacrylamide Copolymer was supplied by AKZO Nobel Chemicals. 3 Erythrulose was supplied by DSM Nutritional Products. 4 Dermacryl-79 (INCI: acrylates/octylacrylamide copolymer) is a film-forming polymer, used in self-tanning formulas. Journal of the American Academy of Dermatology, 1999, 41(6), 831-841. 5 Sunscreen actives in combination with Floraesters K-20W Jojoba was preferred by consumers over the vehicle test article. 6 Percent Change in Skin Hydration from Baseline (Corneometer). 7 Mexameter MX 18 is a product of Courage+Khazaka Electronic GmbH (Koln, Germany). 8 Camelina measurements (i.e. skin color) via Mexameter MX 18® were conducted at baseline, and 24, 48, 72, and 96 hours post sunless tanning formulation application.

**Enhanced Consumer Preference**

Objective: To determine if Floraesters K-20W Jojoba could increase skin color retention when incorporated into a sunless tanning formulation which contained 5% DHA.

Design: One application of each of the sunless tanning formulations was made (2.5 mg/cm²) to randomized locations on the lower backs of fifteen male and female subjects. End Point: Melanin measurements (i.e. skin color) via Mexameter MX 18® were conducted at baseline, and 24, 48, 72, and 96 hours post sunless tanning formulation application.

**Increased Color Retention**

Objective: To determine if Floraesters K-20W Jojoba could increase skin color retention when incorporated into a sunless tanning formulation which contained 5% DHA.

End Point: Melanin measurements (i.e. skin color) via Mexameter MX 18® were conducted at baseline, and 24, 48, 72, and 96 hours post sunless tanning formulation application.

**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.

**Conclusions**

- Floraesters K-20W Jojoba increased skin color retention when incorporated into a sunless tanning formulation.
- Floraesters K-20W Jojoba increased skin color retention 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.
Self-Tanning Formulations are Improved with the Addition of Floraesters K-20W Jojoba


For the Society of Cosmetic Chemists 2013 Sunscreen Symposium

September 19th - 21st, 2013
Orlando, FL

iLabel® – Floratech Information Instantly

iLabel delivers valuable product information instantly. It supplies lot-specific information including certificates of analysis, material safety data sheets, product specifications and technical data.

iLabel saves time by providing instant access to global regulatory information, clinical efficacy data, and demonstration formulas featuring Floratech products.

iLabel is an easy-to-use tool that does not require registration, usernames, or passwords.