

nutmeg newsletter



Q3 2023

PHOTOS FROM HARTFORD YARD GOATS BASEBALL GAME

CTSCC's Summer Social Event

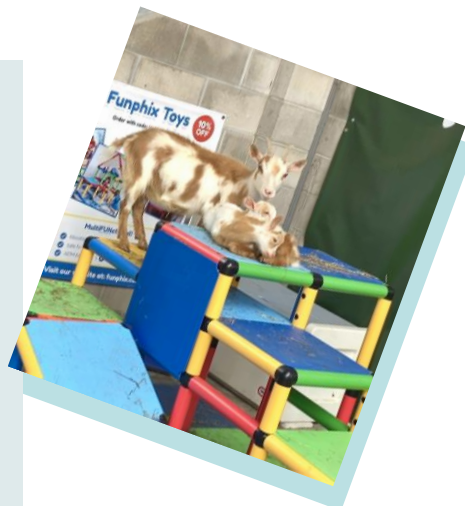
June 11th, 2023

CTSCC members and their friends and families enjoyed our first-ever baseball game featuring the Hartford Yard Goats competing against the Somerset Patriots! There were even some actual goats in attendance!



Inside this issue:

- Letter from the Chair
 - 2023 Board
- Technical Corner: Sunscreen Formulations – Emphasis on Inorganic Sunscreens
- April Dinner Meeting Photos
 - Trivia Question
 - Upcoming Events
- FREE SCC membership for undergrad students
- FREE on-demand webinars



Letter from the Chair

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Dear CTSCC Members and Friends,

Summer has begun and I hope everyone is enjoying it so far. A big thank you to everyone who attended our recent events. Kyle Ryder of CHT presented a fascinating talk on “Silicones: A Great Match for Sustainability and Performance... Debunking the Myths!” on Tuesday, April 18th at The Water’s Edge at Giovanni’s in Darien. It was a very eye opening presentation about silicones. The CTSCC also hosted a social event on Sunday, June 11th at a Hartford Yard Goats baseball game. It was in the picnic pavilion section of the stadium and aside from being a very hot day, was a great time. My son caught a free t-shirt followed quickly by my husband catching a home run ball!

The NYSCC is hosting their annual golf outing on Monday, July 24th. You can find more information about this event on their website (nyscc.org).

Summertime is otherwise quiet in our chapter. Once summer is over, we’ll be hosting our 2nd annual Oktoberfest event. It will be held on Thursday, September 28th at Third Place by Half Full in Stamford. More details to come.

Enjoy the long, sunny days!



Faith Corbo
2023 Chair, Connecticut Chapter
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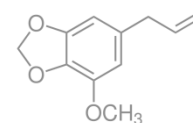
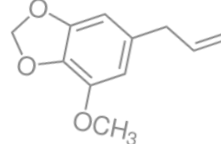
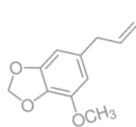


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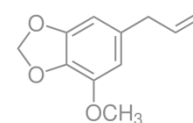
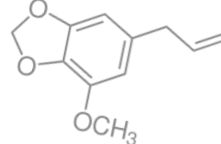
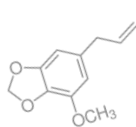


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Interested in volunteering? Reach out to any board member or ctscnews@gmail.com to learn more!



Technical Corner

This article was originally published in the
NYSCC Cosmetiscope Volume 29 Issue 4

Sunscreen Formulations – Emphasis on Inorganic Sunscreens

Author: Hani Fares

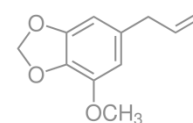
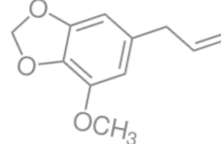
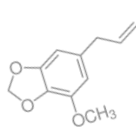


Ever since the FDA published their proposed monograph ruling in February 2019 recognizing titanium dioxide and zinc oxide as the only Category I (Safe and Effective) sunscreens, a cascade of reformulations of most sunscreens products on the U.S. market took place. Inorganic sunscreen formulations are now center-stage and are slowly replacing organic sunscreen formulations. In fact, the trend started in 2018 when the state of Hawaii proposed a ban on octinoxate and oxybenzone, stating that these two sunscreens have a negative effect on coral reefs. Now that the ban is in effect, another bill is proposing to ban sunscreens containing octocrylene and avobenzone for the same reasons. It is true that many regulatory bodies including the FDA did not support the Hawaiian ban, and the Personal Care Product Council (PCPC) is addressing the proposed monograph rulings. All these actions might lead to uncertain outcomes. In fact, in a few years U.S. consumers might be limited to the use of products only containing inorganic sunscreens (with the exception of ensulizole and ecamsule). There is some hope that certain Time and Extent (T&E) molecules are being reviewed by the FDA and may be approved for launch. Bemotrizinol is a front-runner and its use in formulation is quite good as it protects skin from both UVB and UVA radiation.

Selecting the Right Inorganic Sunscreen

Zinc oxide and titanium dioxide not only refract light but also absorb it. The refractive index of titanium dioxide is 2.8 whereas that of zinc oxide is only 2.0. This makes titanium dioxide much more effective at scattering light when delivered from a formulation. In terms of absorption, zinc oxide and titanium dioxide have conductance bands around 3.4 and 3.1 eV, respectively. This makes zinc oxide a bit more efficient in protecting against UVA rays and titanium dioxide more efficient at shielding UVB rays. As particle size decreases there is a much more pronounced blue shift due to a change in the band-gap width. For example, a 0.15 eV blue shift has been reported for 4.7 nm particle size titanium dioxide compared to bulk. Keep in mind, when particles become smaller than their optimal light scattering size (typically half their wavelength) they become much more transparent. For example, zinc oxide becomes transparent below 200 nm whereas titanium dioxide becomes transparent at sizes around 10-20 nm. This makes formulating with zinc oxide much easier to achieve transparent formulations but harder to reach high SPF due to its performance in the UVB region.

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Technical Corner

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Selecting the Right Inorganic Sunscreen (cont.)

Sometimes the so-called “boosters” can help many formulators resort to using salicylates as UVB boosters in their formulations. Butyl octyl salicylate is not an approved sunscreen in the U.S. but many formulators use it to boost their inorganic sunscreen SPF while claiming no organic sunscreens added.

Dispersion Versus Powder

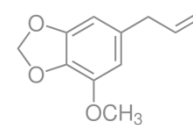
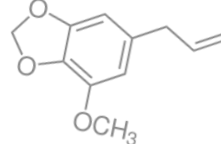
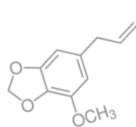
The choice to use inorganic sunscreens as powders or dispersions in formulations is a very polarizing decision and many formulators prefer to use one type over the other. In general, dispersions claim to have a smaller primary particle size which results in better dispersion of the pigment into the emulsion and leads to higher SPF and less whitening on the skin. However, dispersions come at about 50% w/w solvent/pigment, which limits the flexibility for the formulator to tweak the formulation. In addition, when working with water-in-oil (w/o) or water-in-silicone (w/si) formulations, it is harder to control the viscosity of such emulsions when using dispersions. In these types of emulsions, the viscosity is built by the internal phase (water). Using dispersions ultimately increases the amount of external phase and reduces the amount of water used, which will make such emulsions less viscous and less stable. The use of powders, on the other hand, gives the formulator a lot of flexibility and reduces the cost of the formulation. Although, when using powders, it is important to have the manufacturing capability to grind the pigments at the factory (on a commercial scale) to reduce agglomeration and produce formulations with good aesthetics.

Selecting Emulsion Type

Most inorganic sunscreen formulations on the market are w/o or w/si emulsions. Such emulsions are much easier to preserve, as you only need to preserve the internal phase, and their pH does not fluctuate since they are anhydrous. These types of emulsions inherently have very good water resistance as well. Some of the drawbacks of w/o emulsions are their greasy feel mainly imparted by the surfactants and co-surfactants used. They tend to be more whitening on the skin and harder to spread. On the other hand, w/si emulsions have a superior end-feel, but they are not particularly biodegradable or earth friendly by today's standards. They share the same characteristics as w/o emulsions when it comes to preservation, pH, and water resistance. In general w/si emulsions are harder to stabilize and require the use of more than one surfactant to obtain stable emulsions. It is very rare to see o/w emulsion formulations on the market, since they are harder to preserve and stabilize. The presence of zinc oxide ultimately shifts pH towards 7.5, which renders most preservatives less effective. In addition, at that pH very few polymers work well at stabilizing the emulsion, especially naturally derived polymers. On the other hand, these emulsions typically have a nicer feel on the skin and could be cost effective.



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Technical Corner

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Adding a Film Former or SPF Booster

Selecting a film former or SPF booster for the emulsion is a critical step and one that should not be avoided. The selection of the appropriate polymer depends mostly on the experience of the formulator and the in vivo performance of a particular polymer. Many polymers are marketed to formulators and some of them could work in one formulation or another. However, it is crucial that the film former works across many formulations. We should always test the formulations in vitro for water resistance and SPF to ensure that the addition of the polymer will give the desired results. This will enable the formulator to refine the level of polymer in the emulsion as well. Finally, once a proposed composition is established for the final product, in vivo testing should be conducted.

Concluding Remarks

In conclusion, I hope that I shed some light on formulating inorganic sunscreen emulsions and leave it up to the creativity of formulators to create excellent formulations with great aesthetics and high SPF.

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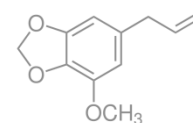
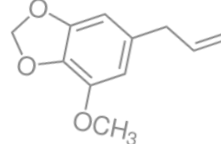
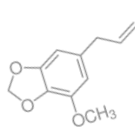
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Technical Corner

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About the Author

Dr. Fares started his career in personal care studying the effect of solvents on sunscreen chemicals. His interest in skin drug delivery, especially from polymeric matrices, evolved during his graduate work at Rutgers University, where he received his Ph.D. Dr. Fares worked at Block Drug and GlaxoSmithKline where he held positions in Research and Development in the areas of Skin Care and Oral Care. Then, he joined L'Oréal where he held several positions of increasing responsibility, ultimately serving as Assistant Vice-President of Skin Care. He is currently the Senior Director of Skin Care and Oral Care at Ashland Specialty Ingredients. Dr. Fares is the author of many publications and patents in the areas of Sun Care, Skin Care, and Oral Care and has made many presentations at national and international conferences. He chairs the NYSCC Scientific Committee and has won multiple awards in the areas of sun care and polymer chemistry.



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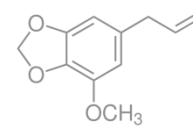
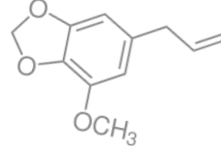
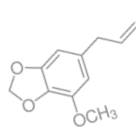
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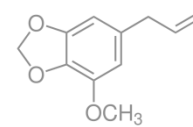
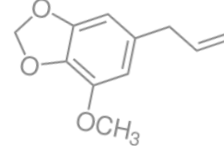
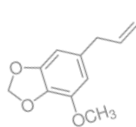


April Dinner Meeting Photos



Kyle Ritter from CHT USA gave an insightful talk on debunking the myths around silicones, and even made a case for their sustainability



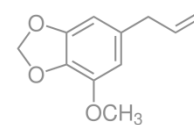
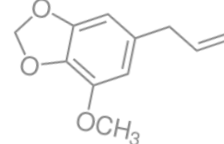
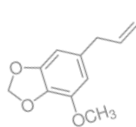


April Dinner Meeting Photos



The small group enjoyed a tasty dinner & dessert at Giovanni's. Attendees had the opportunity to ask many questions during the presentation. Kyle even taught some attendees a simple magic trick!





Trivia Question

Nowadays, people on average wash their hair once every two to three days, and it is very common for one to wash their hair every day. More than a century ago, on May 10, 1908, The New York Times outlined “simple rules” on [How to Shampoo the Hair](#) that documents recommendations for using shampoo. What is the article’s recommended frequency on washing healthy hair?

- A. Everyday
- B. Once a week
- C. Once a month
- D. Once every three months



Thank you to Sophie Sun, R&D Hair Care Intern @ Henkel, for contributing this question!

Check page 13 for the correct answer!



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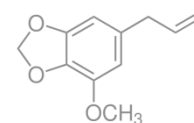
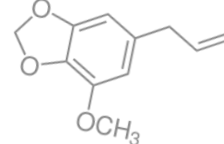
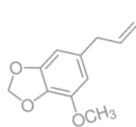
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Keti Vaso

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CTSCC Newsletter Editor
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Membership with CTSCC since: 2021

Member of SCC since: 2021

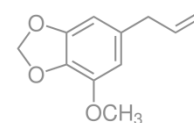
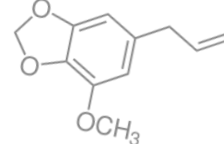
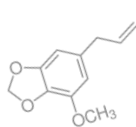
How did you get into the industry? I majored in chemical engineering during my undergrad and masters studies. I always loved hearing about how chemists and chemical engineers are involved in developing the products we find on store shelves. During my junior year of undergrad, I had the opportunity to intern at a personal care company that helped further develop my interests. When I was job hunting at the end of my masters, a former classmate reached out to me about an open hair care chemist position at Henkel and encouraged me to apply. The rest is history!

What's the best part about your job? I love working as a scientist in this industry because it is such a great mix of technical and creative work. It's lots of fun to learn about the science behind new technologies and see the effects they have on your final formula. I love knowing that the products I develop help make consumers look and feel good!

What's your favorite event that CTSCC hosts? I really like the monthly dinner meetings. The presentations are about different topics in the industry, so it's interesting to learn about topics that I'm not familiar with from my day-to-day work. It's also a great way to make new connections!

What advice would you give to someone just starting out in the industry? Constantly seek out opportunities to learn. Luckily this industry offers so many learning resources so there is always something available for those who are interested. Also don't be afraid to ask questions. If you're a formulator, make a lot of batches and don't be afraid to mess up in the lab! 😊

Favorite restaurant in Connecticut? I'm not sure if I have a favorite because there are so many good options! Barcelona in Stamford is definitely a top contender though. Their tapas are amazing!



Upcoming Events

NYSCC Annual Golf Outing

July 24, 2023

SCC CEP Course: Fundamentals of Surfactants, Emulsions, and Polymers for Cosmetic Formulations

On-Demand Online Course
Access July 17 – August 20, 2023

SCC CEP Course: Fundamentals of Biosurfactants, Bio-based Surfactants and Biopolymers: Overview, Properties, and Formulation Design

Live Online Course August 2 & 3, 2023

NYSCC Fishing Trip


August 12, 2023

New England Chapter: Root 4 Hair: Fighting Against Color Fading and Aging

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CTSCC 2nd Annual Oktoberfest

September 28, 2023

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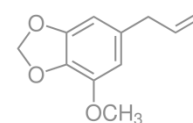
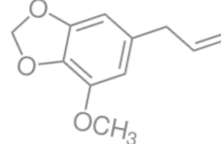
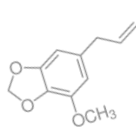
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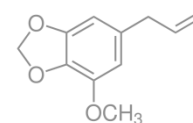
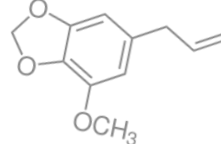
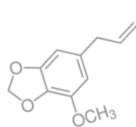
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Also check out NYSCC's At Home Live Series 2.0 for other webinar offerings!

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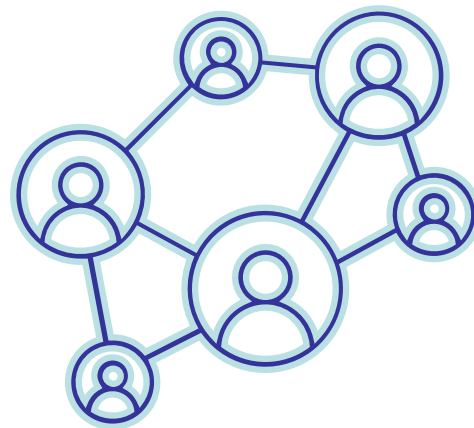
Is there a **technical article**, raw material insight, relevant writing, or other piece you'd like to share with the community?

Have you captured **photos** at CTSCC events?

Please contact Keti Vaso to be featured in the newsletter
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Photo of Hartford by Ilirjan rrumbullaku (Flickr)

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