NORTHERN HIGHLIGHTS

The SCC Ontario Chapter's Newsletter

August 2021 **Volume XCIX**

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IN THIS ISSUE...

"GMPs For Cosmetics In Canada"

2 Day Online CEP Course

Day 1: September 21, 2021 (11:00am - 2:30pm ET)
Day 2: September 22, 2021 (11:00am - 2:30pm ET)

Free = SCC Members - Ontario Chapter
US$100 = Non-Members (Ontario)

PRE-REGISTER FOR THIS 2 DAY CEP COURSE

As this particular event is "On-Line" simply click on the button below which will take you to our registration page. You will receive a calendar invite with the link to the meeting.

Click Here To Register

Online CEP Course: GMPs for Cosmetics in Canada

Instructor: Karl F. Popp, R. Ph.
Format: Virtual - live online lectures w/Q&A
Day 1: September 21, 2021 (11:00am - 2:30pm ET)
Day 2: September 22, 2021 (11:00am - 2:30pm ET)

This online CEP course is being produced for the SCC Ontario Chapter.

Course Summary

The course will provide an overview current Good Manufacturing Practices for both Cosmetic and OTC products. The course is presented to educate and review salient aspects of the cGMP regulations for drug products and globally interesting GMP regulations for cosmetics. Formulators, production personnel, business and plant managers, business owners, quality team members and auditors will benefit from the practical, Quality Systems approach used to describe GMP requirements and activities.

- In addition to the live instruction and Q&A, attendees will have access to a full replay of the course for two weeks following the live course dates.

Instructor

Karl F. Popp, R. Ph. founded KPopp Consulting, LLC in 2010 as a consulting firm providing services to pharmaceutical, cosmetic and allied industries. He also is a practicing retail pharmacist. From 1989 to 2008 he was associated with Stiefel Laboratories as Director of Product Development, and later as Senior Director of Special Projects coordinating external manufacturing, global research activities, and managing the corporation's intellectual property estate. Prior to joining Stiefel in 1989, he was a Scientist and Project Manager for the Sterling-Winthrop Research Group. During his career he has been responsible for the development of products that have generated over $2 billion in sales. He has over 40 years or experience in laboratory and GMP production operations. He earned his B. S. in Pharmacy from the Albany College of Pharmacy, an M.B.A. from Rensselaer Polytechnic Institute. Karl is a member of the Society of Cosmetic Chemists and a licensed pharmacist (NY). He has been active in the SCC in coordinating local educational seminars and as past New England chapter chair, has served on the National Committee on Scientific Affairs and as the Society's President in 1999. Karl was elected a Fellow of the Society in 2002 and an Emeritus Member in 2015. He is an inventor, an author and a scientist. His interests encompass topical, oral, inhalation, and parenteral dosage forms in addition to various therapeutic categories. During his over 40 years in the industry, Karl Popp has lectured around the globe on new product development activities including GMPs, regulatory strategies, product pipeline efforts, process validation, product life cycle management, and management of intellectual property.

Who Should Attend

The course is designed not only to introduce GMPs to those new to the industry, but also as a review for those experienced in this regulatory area. Participants will leave with an appreciation of the intent of the GMP regulations and knowledge of factors impacting the organization and personnel, buildings and equipment, cleaning and sanitization activities, component and process controls, laboratory and production documentation, packaging and label controls, as well as complaint and recall management. Participants will also learn about preparing SOPs, components of a stability program, importance of process water for manufacturing, what is meant by process validation, and the importance of internal audits.

Pricing

Free = SCC Members - Ontario Chapter
$100 = Non-Members (Ontario)

REGISTER NOW

Note: If you need assistance with a group registration, or have any other questions, please contact the SCC Headquarters staff at cep@scconline.org.

View our CEP Course Pricing and Refund Policy here.

CEP Course: GMPs for Cosmetics in Canada

Program Contents

The following areas will be covered during the course:

- Insights to Canadian Cosmetic Regulations
- Organization and Personnel
- Buildings and Facilities
- Equipment and Calibration
- Cleaning and Sanitization
- Control of Components
- Laboratory and Production Documentation
- Production and Process Controls
- Packaging and Label Controls
- Exporting Cosmetics to the US
- Stability Testing
- Warehousing and Distribution of Product
- Laboratory Controls
- Writing SOPs
- Process Water Systems
- Management of Complaints and Recalls
- Validation activities
- Auditing, Internal and External, for Compliance

Schedule

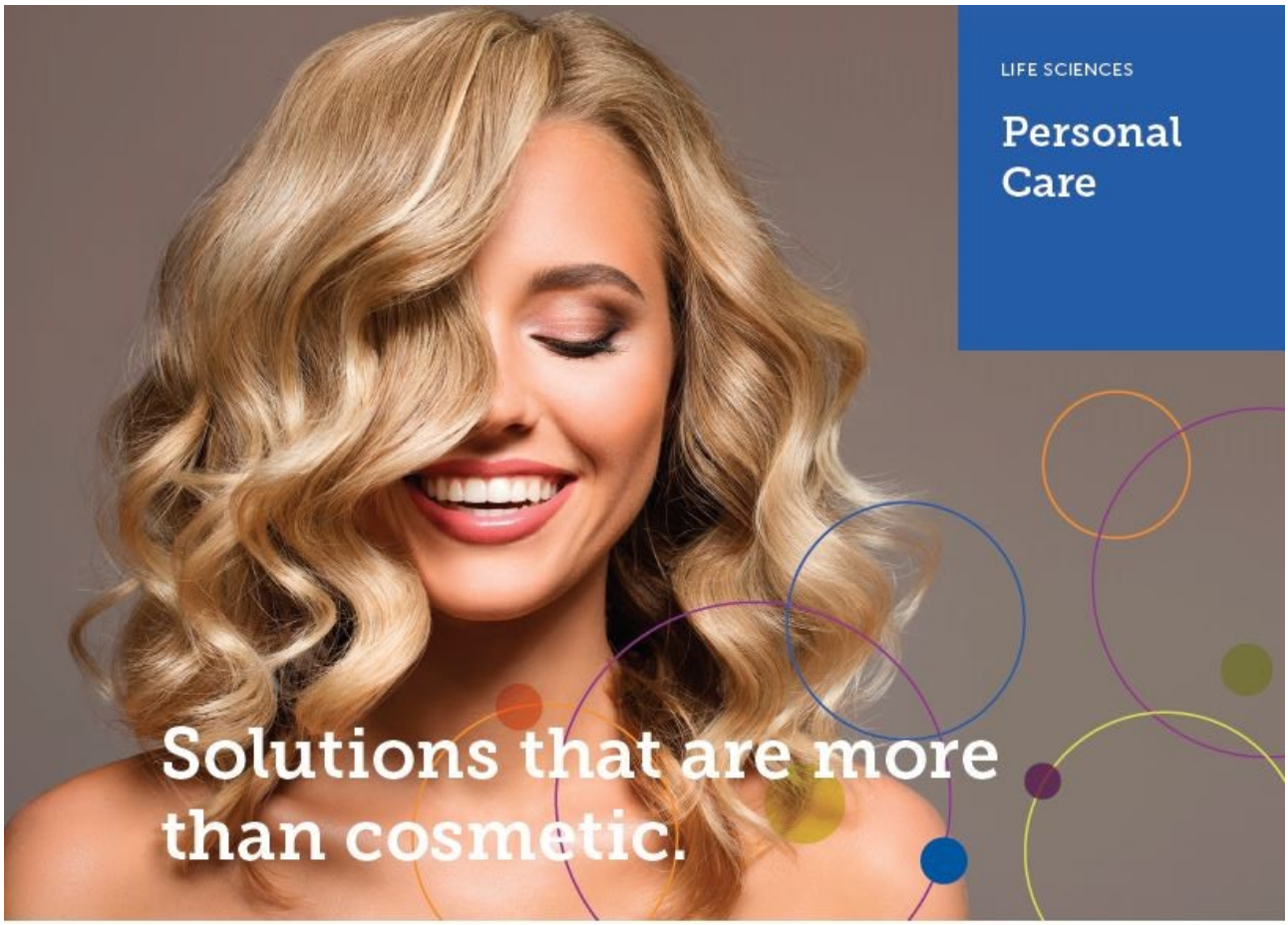
DAY 1 (09/21/2021)

- 11:00am-12:30pm ET - Live Lecture & Q&A
- 12:30pm-1:00pm ET - Break
- 1:00pm-2:30pm ET - Live Lecture & Q&A

DAY 2 (09/22/2021)

- 11:00am-12:30pm ET - Live Lecture & Q&A
- 12:30pm-1:00pm ET - Break
- 1:00pm-2:30pm ET - Live Lecture & Q&A

This online CEP course is being produced for the SCC Ontario Chapter.



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2022 SCC Ontario Chapter Board Elections

It is time for the election of the 2022 SCC Ontario Chapter Board Members. We have two positions open for election this year: Chair-Elect and Secretary.

As a member of the SCC Ontario Chapter you will soon be sent specific instructions on how to cast your electronic vote!

Elections are open to all General Members of the SCC Ontario Chapter. If you have any questions please contact one of the current board members listed below. The newly elected board members will be introduced at the November 4th, 2021 meeting. Thank you for taking time to vote. Your support of the SCC Ontario Chapter is greatly appreciated.

2021 SCC Ontario Chapter Board Members

Position	Name	Phone	Email
Chair	Shahin Kalantari	416-567-6572	shahink@davicenna.com
Chair-Elect	Mary Seifi	416-726-2702	mseifi@grantinc.com
Treasurer	Robert Castillo	416-740-5300	rob.castillo@univarsolutions.com
Secretary	Andrea Boylan	905-795-0911	andrea.boylan@andicor.com

2022 Ontario Chapter Candidates

CHAIR ELECT
Candidate: Elizabeth Peitsis
Liz is currently, proudly, Employed at IMCD as a Technical Sales Account Manager. Liz has contributed to the SCC and Cosmetics Industry for over 15 years. She has worked/excelled in both Sales and Supply Chain/Manufacturing with unique/broad experience and understanding within the Cosmetics field. Through various roles, her willingness to help, dedication and integrity is well known and respected within the industry. Her driven, innovative and outgoing personality is always evident, striving for the best, taking pride in all endeavours. Previously Chair of 2018 -Continual Success and Excellence will be transferred to role of SCC Ontario Chair Elect/Chair 2022/2023. Looking forward to the future, better times and great successes.

SECRETARY
Candidate: Tanya Baksh
Tanya Baksh earned a Bachelor of Science degree from the University of British Columbia in 1997. Tanya is currently working as Sales Manager for the Canadian market for Essential Ingredients heading up the expansion into Canada. Over the years Tanya had various Sales and Product Management roles in various industries at Canada Colors and Chemicals. The most recent role prior to joining Ei was Sales Manager for the Food and Fine Ingredients Canadian team at CCC Ingredients and Account Manager for Personal Care accounts in Ontario for about 10 years until the acquisition of CCC by Brenntag in 2018.

Tanya has been an active SCC Ontario chapter member since 2015 and recently became Board Member at the end of 2019. Tanya is excited to further her involvement with the SCC Ontario chapter in the hopes of paving a brighter future for the cosmetic industry

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PROGRAM

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Seneca WORKS

This program requires the application of GLP and GMP practices, producing students who are detail oriented, well organized and have excellent communication and presentation skills. Students are provided with specialized training for careers in the product development, formulation and testing, regulatory and quality aspects of the cosmetic industry.

PROGRAM FEATURES

As the only Cosmetic Science graduate certificate program in Ontario, it focuses on product formulation and cosmetic production while emphasizing the industry's evolving regulatory environment.

This program is affiliated with the following organizations:

- Society of Cosmetic Chemists (SCC)
- Cosmetics Alliance Canada

INDUSTRY SKILLS

- Prepare solutions, lotions and creams, and assist in development
- Assist in preparation and development of pigmented products
- Apply knowledge of Personal Care Product Regulations
- Review labels
- Perform and report microbiological assays
- Perform skin testing to support claims substantiation
- Operate analytical instrumentation (HPLC, GC, FTIR) according to GLP standards
- Assist in preparation of C of A
- Perform stability studies
- Perform literature searches and prepare summaries
- Assist in preparation and review of SOPs
- Communicate and co-ordinate with team members

RECRUITMENT AND HIRING PROCESS

- Work terms take place from May to August or from September to December and last up to four months
- The recruitment and application process begins three to four months prior to the job start date
- Hire in three simple steps: email us a job description, review and shortlist candidate applications, interview and select candidate(s)

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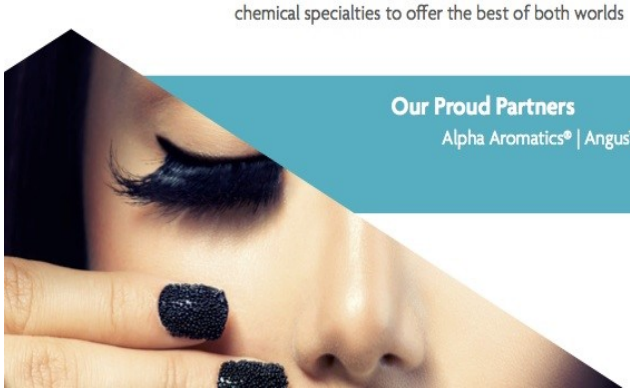

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SURVEY SAYS...

Please keep an eye out for our "**post meeting**" opinion surveys following our Chapter meetings and special events. Each year the **Ontario Chapter** is privileged to host many fine speakers and we would like to recognize them for their efforts. Following each meeting attendees will receive a ***very short survey*** asking to rate the speaker. Responding gives you a chance to win a $25 gift card!

At the end of the year we will tally the results and present one of them with an award as **"Speaker of the Year"**.

May 27th Virtual Meeting Recap

The SCC Ontario Chapter was please to host Alison Griffin from Sudarshan North America where the "virtual" topic of the day was "***Expanding the Rainbow': Colors & Trends – Where they Come From and How they Influence Cosmetics, Fashion, Home & Décor".*** Alison's presentation went into great detail as to how colours and colour have been influenced by our society for centuries! She went on to discuss how these trends can be influenced by the economy, world events, music, celebrities and marketing companies. By comparison Alison talked about past trends as well as present and also how the home & décor trends are influenced in parallel to the fashion & cosmetics trends.

Alison's presentation was recorded and can be viewed here 

Alison Griffin has over 25 years of experience in the Cosmetics / Personal Care industry. Starting her career in R&D, she has worked in both the finished good end (Avon Skin Care Lab) as well as in the supplier end. She has 20 years of experience in raw material sales, 10 of which have been for pigments companies.

She has been the recipient of Regional Sales Awards / Regional Marketing Innovation Award, two SCC Chapter Speaker Awards and the NYSCC Chapter Merit Award (where she was also Chair) She has a B.S. (Biology) from Gettysburg College and an M.A. (Cosmetic Science) from Fairleigh-Dickinson University.

July 14th Virtual Meeting Recap

On July 14th, 2021 the SCC Ontario Chapter held a "bonus" summer virtual meeting and were happy to have guest speaker **Noellie Astruc** present on the topic of "**Navigating buzzwords to address demand for naturality".** The presentation discussed consumer demand for natural cosmetics which she noted has been continuously growing over recent years, with a great focus on truly natural products containing natural ingredients. Noellie discussed how consumers want full naturality. It is not just about a product to address a fleeting trend; they want a series of attributes that address their long-term 360° lifestyle for wellness and holistic well-being goal. In addition to the lack of definition from regulatory bodies for "natural", thus for "Natural beauty", recent years have seen the emergence of many buzzwords used to describe industry market movements, such as "Clean beauty", "Green beauty", and more recently "Conscious beauty", which are being used with various interpretations. Thus potentially causing confusion in the marketplace and possible consumer misconceptions.

Noellie's presentation was recorded and can be viewed here 

Noellie Astruc has over 5 years of international experience in the cosmetics industry. She has worked for global corporations around the world, such as Beiersdorf and L'Oreal, as part of their research & innovation teams. Noellie Astruc graduated with a Chemistry Engineering degree from CPE, Lyon, and a Business Development master's degree from INSA Toulouse. As a Business Development Specialist for the Midwest and Canada regions, Noellie supports clients in the beauty industry with natural solutions.

How much do you really know about Fats and Oils?

Written by Benjamin Schwartz, Senior Personal Care Applications Specialist – AAK

FATS AND OILS ARE UBIQUITOUS IN PERSONAL CARE AND COSMETIC FORMULATIONS.

So much so that as cosmetics chemists we often take them for granted or fail to appreciate their various characteristics. Whether natural plant oils/fats, synthetic esters, or petroleum-derived hydrocarbons, we often don't consider much more than the aesthetics of whether one feels lighter or heavier, slippery or draggy. Even more overlooked is how their unique chemical compositions determine those characteristics and how they apply to different product types.

Despite our industry's somewhat naive approach, this is a subject that can encompass entire careers for some lipid chemists. But for the sake of blog-post brevity we will keep the scope of this current conversation somewhat narrow.

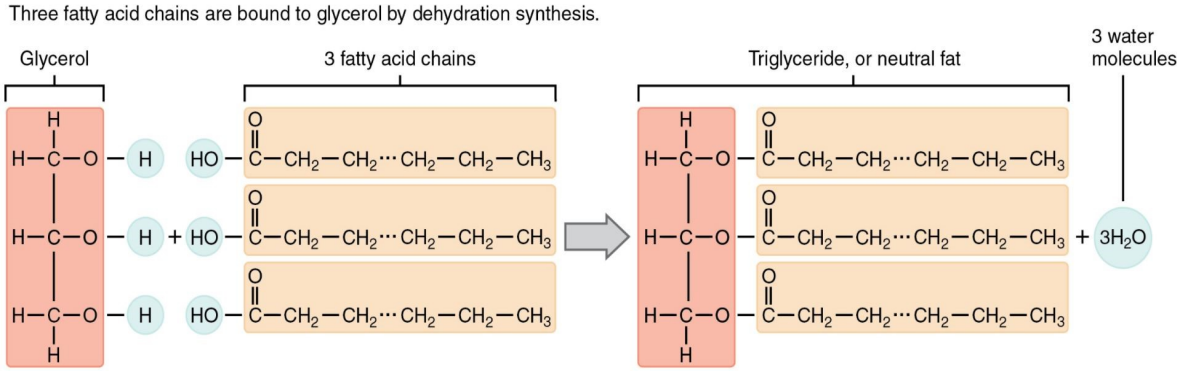
Here we'll go through a brief overview of how the molecular structure of triglycerides, and the fatty acids that comprise them, determine the interdependent properties of oxidative stability, melt profile, and compatibility of different oils and fats. Knowing how these properties determine the unique characteristics of particular oils and fats can help us to make better choices for different product applications.

WHAT ARE TRIGLYCERIDES?

To take things all the way back to the beginning, we should explain that triglycerides are the major molecular class comprising natural fats and oils. Which is also to say that the science of oils and fats can often be reduced to the science of triglycerides. This is because once natural oils and fats have been put through their typical processing and refinement the only non-triglyceride components usually left will be sterols (and some other sterol-like components), and often at a level less than 1%. So, it can often be safely assumed that the characteristics of different oils and fats are simply the macro level behaviors of different combinations of various triglycerides.

So, let's look at the basic structure of triglycerides and their constituent fatty acids. A triglyceride is composed of three fatty acid chains connected via a glycerol backbone. The bonds at which the fatty acids join the glycerol are ester bonds, created by dehydration synthesis using the carboxylic group of one fatty acid and one of the hydroxyl groups of the glycerol (Fig. 1):

Fig.1 – Triglyceride ester formation via dehydration synthesis



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Once the triglyceride is formed we get a structure like that shown in Fig. 2:

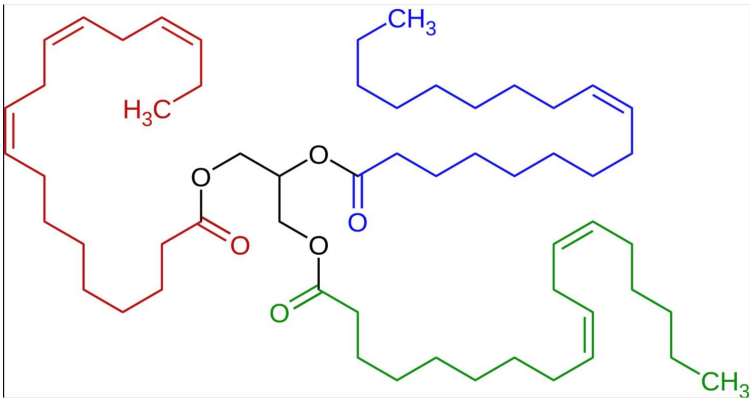
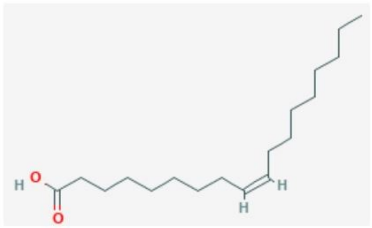


Fig. 2 – Example triglyceride with one oleic chain C18:1 (blue), one linoleic chain C18:2 (green), and one linolenic chain C18:3 (red)

(It's important to remember that the structure shown in Fig. 2 is a flattened two-dimensional depiction of a three-dimensional object. In reality, this molecule would be folded into a complex, bulky shape.)

As you can see in Fig. 2, there can be different types of fatty acids present in a single triglyceride molecule. Some may be fully saturated, like Stearic Acid (Fig. 3), and have an overall linear shape, with no kinks or bends. Others may be mono-unsaturated like Oleic Acid (Fig. 4), or poly-unsaturated like Linoleic Acid (Fig. 5), and capable of bending and folding in various ways. The degrees of unsaturation (or the number of double bonds in the chain) determine the flexibility of each chain, and thus the possible shapes and comportments of the overall molecule.

Fig. 3 – Stearic Acid C18:0



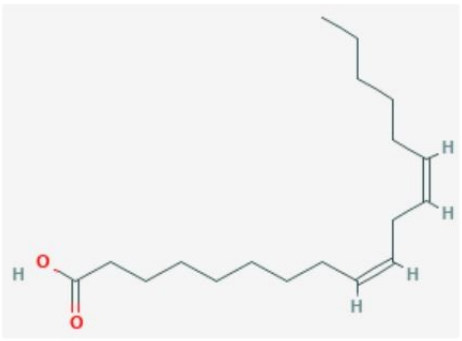


Fig. 5 – Linoleic Acid C18:2

WHY IS THIS IMPORTANT?

There are two crucial things to take from these descriptions and illustrations of fatty acid chains and their structural contribution to triglyceride composition and shape.

One, is that the relationship between the degrees of unsaturation of the fatty acid chains and the shape of the overall triglyceride molecule is what **determines the melt point of the triglyceride (or rather the melt point of a significant mass of identically constituted triglyceride molecules)**. This relationship between unsaturation and molecular shape also relates to compatibility of different oils and fats, which we won't discuss much here.

Two, is that the degrees of unsaturation within the fatty acids of a triglyceride **determine the vulnerability of that triglyceride to degradation via oxidation (also to photodegradation)**.

So, a mass of oil or fat that has higher degrees of unsaturation within its constituent fatty acids will have a lower melt point and a greater vulnerability to oxidation. While a mass of oil or fat that has lower degrees of unsaturation within its constituent fatty acids will have a higher melt point and a lower vulnerability to oxidation.

Thus, degrees of unsaturation and melt point have an inverse relationship. That is, the more unsaturation, or the more double bonds present, the lower the melt point (Fig. 6). As well, the degrees of unsaturation and oxidative stability also have an inverse relationship. That is, the more unsaturation, or the more double bonds present, the lower the oxidative stability.

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Seneca News & Updates

Seneca College is pleased to announce the three recipients of the 2020/21 Society of Cosmetic Chemists Bursary and Scholarship Awards!

Society of Cosmetic Chemists Scholarships
Nadreen Elshawish
Lachae Hood

Society of Cosmetic Chemists Bursary
Jaeden Cowan

Please take some time to read through our very worthy recipients thank you letters…

Video featuring Seneca President David Agnew

2021 SENECA Awards — Thank you letter

Award: Society of Cosmetic Chemists Award

Received by: Nadreen Elshawish

Program: Cosmetic Science

Dear Donor,

My name is Nadreen Elshawish, I am a current Cosmetic Science student and a recent Bachelor of Chemistry graduate. This past year, I have had the incredible opportunity to be a part of Seneca's Cosmetic Science program. I have gained knowledge in the various aspects of cosmetic product development, specifically: marketing, regulations, formulation, quality assurance, and product evaluation. I found this information vital, as I was able to apply this knowledge to my Capstone project. The Capstone project was a major aspect of why I joined Seneca's Cosmetic Science program, as it is an excellent opportunity to gain hands-on experience. The past four months I have been able to formulate my Capstone product in the laboratory from start to finish – an extremely unique opportunity. I also had the chance to formulate various other products through the classes offered in the program. More specifically, I really enjoyed the pigments class, as I was able to formulate lipsticks, lip glosses, eyeshadows, and hot pours, all while gaining experience in colour matching. Evidently, the Cosmetic Science program is one of a kind and an excellent opportunity to gain knowledge and laboratory experience to further my career goals of working in the cosmetic industry.

Although this past year has been challenging due to the pandemic and the shift to online learning, the professors and faculty did an excellent job in ensuring we were taught all the necessary information and had the chance to be in the laboratory. Unfortunately though, the pandemic has caused a great financial burden for many, yet the generosity of the Society of Cosmetic Chemists has eased this by supporting my studies. This past year has been unlike any other, and I am glad to have met knowledgeable professors, lab instructors, and classmates. Lastly, I am excited to announce that because of the Work-Integrated program that Seneca College offers, I will be working as a Regulatory Affairs student this summer. I am excited to put my knowledge to the test, and work in the industry – a goal that I have had for a while.

Once again, I wholeheartedly appreciate the generosity and sincerely thank the Society of Cosmetic Chemists for this award.

Nadreen Elshawish

2021 SENECA Awards — Thank you letter

Award: Society of Cosmetic Chemists Bursary

Received by: Jaeden Cowan

Program: Chemical Laboratory Technology – Pharmaceuticals

Dear Donor,

My name is Jaeden Cowan, and I am honored to be one of the recipients of the Society of Cosmetic Chemists Bursary. I am currently in the program of "Chemical Laboratory Technology – Pharmaceuticals" at Seneca College.

A few personal hobbies of mine are reading fantasy, sci-fi, and dystopian genres, and journaling to keep my busy life organized. My favourite course is currently chemistry. Chemistry is everywhere in the world around us. It is in the food we eat, clothes and makeup we wear, water we drink, medicines and cleaners that we use. I believe that chemistry is the central science or the root of science because it connects other sciences together, so a good understanding of chemistry makes other sciences easier to understand.

Studying at Seneca College helped me find this love of chemistry because of the amazing faculty and resources available to me as a student. Throughout my studies during the 2020/2021 school year, I was able to meet some fantastic and helpful faculty through my online learning and practical learning in the school's laboratories. The online learning throughout this pandemic has been quite difficult for me to be quite honest. I have been diagnosed with a permanent learning disability, depression, and anxiety which give hardships, but not to mention the new difficulties that arose with complete online learning. But I did not let any of these hardships pull me down, so I pushed through my studies by staying organized and used every minute to be productive, and successfully finished the year. This pandemic has definitely taught me that self-love and mental health are so important, to never take anything for granted, and to live like today is your last and tomorrow is too late.

Your bursary has opened doors and the possibility of a brighter future and will play an important role in shaping me into a successful person in the future. Donors like you make life brighter for us, and I can hope that one day in the future I will be in a position to bring a smile to a student as well. I do not have the words to express my appreciation for your generous support that will help me achieve my career aspirations and goals.

With much appreciation,
Jaeden Cowan

Seneca
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2021 SENECA Awards — Thank you letter

Award: Society of Cosmetic Chemists Award

Received by: LaChae Hood

Program: Cosmetic Science

Dear Donor,

My name is LaChae Hood and as you know I am a student of the Cosmetic Science Program here at Seneca. After completing my undergraduate degree in Biochemistry and working in the medical cannabis sector for a few years, I knew I needed a change. I had always been interested in cosmetics, more specifically hair care products as I rediscovered how to properly take care of my curly hair. It wasn't until I discovered this program, that I realized that there was a science to cosmetics! This program seemed like the perfect fit for me, combining my love for science and cosmetics, while also being able to use my creative side (where a lot of my hobbies lie). Though COVID has been a challenge this year for everyone (even delaying the start of course and decreasing the amount of lab time my class was able to have), I have learned a lot throughout the course of this past year. My favourite courses were definitely Formulation and the Capstone project where I am working on a team to create a cosmetic product from scratch.

I want to thank you for allowing me the opportunity to receive this award, as it relieves some of the financial burden that undergoing this course brings. This award is assisting me in achieving my future goals of becoming a cosmetic chemist and formulator. One day, I would actually love to start my own business that focuses on sustainability in hair care products that are targeted towards curly hair, while also being very travel friendly (another one of my passions).

Best Regards,
LaChae Hood

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Did you know that in Vancouver you can wash your hair with soap but in Montreal you need shampoo? Why? Because Vancouver water is soft and Montreal water is hard. That makes a big difference when it comes to satisfaction with hair washing. Hard water contains dissolved calcium and magnesium ions which react with soap to form a precipitate. This is the classic "bathtub ring." The grayish deposit is bad enough on a tub, but you sure don't want it on the hair. Vancouver has very soft water and soap will suds nicely and will not leave a deposit. In Montreal, on the other hand, the calcium and magnesium in the water will react with soap and form an insoluble scum. The active ingredient in shampoo is a "detergent," which like soap is a long molecule that has one end that is attracted to water and another that dissolves in fat. Dirt is embedded in the oily layer that naturally coats the hair, and the soap or detergent molecules can remove this by anchoring one end in the oil while the other end binds to water. Rinsing then removes the oily layer and the soil it harbours. The big difference between a soap and a detergent is that the detergent does not form a precipitate with calcium or magnesium. And that's why you can use soap in Vancouver to wash your hair but not in Montreal.

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Seneca Capstone Projects 2021

2021 was a trying year for everyone. At Seneca, we had lectures online and labs were reduced in class size and number of labs allowed.

For the Capstone projects we had 3 small companies working with us and a research project from within Seneca. As demonstrated in the past, the students were once again outstanding in what they were able to accomplish in the 14-week period.

The projects included a day cream with ostrich oil and egg yolk, a mattifying primer for acne, a brightening moisturizer for dark skin and an eczema cream. We had the formulators in the lab every week, but the rest of the team work was done via online meetings, including each team's updates and consultation with the companies. The students worked well with the companies and overcame many challenges.

The judges were again amazed at what the students were able to achieve. We were again very lucky to have corporate support for the awards. The winners were:

Winning teams product

Sponsor Company	Amount	Award	Winner
Cambrian	$100	Project Manager	Nadreen Elsawish
Andicor	$100	Marketing	Ostrichland Team
Lucas Meyer	$100	Formulation	Heather McNeil
IMCD	$100	Regulatory	Chloe Li
Dermachem	$100	Packaging	Noura Nachar
StarChem	$100	Quality	Vivian Bui
Vivachem	$500	Team	Ostrichland Team

The Ostrichland team was: Maya Hudon-Kaide - Project Manager, Everyone – Marketing, Yeri Kim – Packaging, Heather McNeil – Formulation, Bonnie Duong – Regulatory and Michelle Li – Quality.

Thank you again to all of the companies that support the Seneca Cosmetic Science Graduate Certificate program and supply samples and guidance to our students! We greatly appreciate everything you do!

Seneca College Cosmetic Science program is looking for companies to partner with for Cosmetic Research Projects and for the student Capstone Projects for January 2022. If you are interested, please contact Tina Perricone at tina.perricone@senecacollege.ca or Sharon Robertson at sharon.robertson@senecacollege.ca

Employment Opportunities

Please check our website for detailed job listings at

http://www.ontarioscc.org/employment.htm

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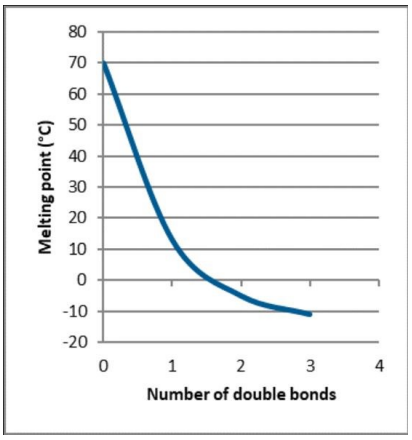

Fig. 6 – Melt point versus double bonds (unsaturation) present in a fatty acid chain

(One thing that we're not considering for the sake of simplicity is the chain length of the fatty acids, though this can be a significant factor in melt point, and to a lesser extent oxidative stability. Though, it should be noted that the degree of unsaturation has a more significant effect on melt point than chain length for the fatty acid range that we typically consider in plant oils and fats. An example of this would be that the melt point difference between Lauric Acid C12:0 and Stearic Acid C18:0 is about 30C degrees, while the difference in melt point between Stearic Acid C18:0 and Oleic Acid C18:1 is about 60C degrees.)

WHAT'S NEXT?

There is a deeper conversation to be had about how individual triglyceride molecules line up when crystallized into a solid, and how this ability of the molecules to stack and align in a particular fashion is really the mechanism that determines the melt point of individual fats oils and the compatibility between different oils and fats, but that's beyond the scope of this post.

As well, there is another conversation to be had concerning how the double bonds present in mono-unsaturated and poly-unsaturated fatty acids are the sites of vulnerability to attack by oxygen atoms, and how that process occurs chemically, but again that is beyond the scope of this article.

(One last technical point is that the analytic measurement used to determine the degree of unsaturation is know as Iodine Value. If you ever see Iodine Value, or IV, on a specification sheet this refers directly to a measurement of how many double bonds there are in a mass of oil or fat. The units are essentially arbitrary, but the typical range is about 0-200, with most natural oils falling in between these two limits. For example, Coconut Oil has an IV of about 8-12, while Flaxseed Oil is about 178.)

Now that we have a decent understanding of fatty acid saturation and how it determines the characteristics of a triglyceride, let's look at a couple of examples of actual oils and fats.

OILS AND FATS

The first is Coconut Oil, which is a fairly simple example, as it is composed almost entirely of saturated fatty acids (Fig. 7).

Coconut Oil Fatty Acid Composition

Fatty Acid Chain Length	Percentage
Caprylic Acid C8:0	9
Capric Acid C10:0	6
Lauric Acid C12:0	47
Myristic Acid C14:0	18
Palmitic Acid C16:0	9
Stearic Acid C18:0	3
Oleic Acid C18:1	6

Fig. 7 – Coconut Oil Fatty Acid Composition. Dominated by Lauric Acid, a medium chain, saturated fatty acid.

We can see that only about 6% of the triglycerides of Coconut Oil are composed of unsaturated fatty acids. Thus, given what we just reviewed, we should expect that Coconut Oil will have a relatively higher melt point and that it should be relatively stable against oxidation. And that is what we see. Anyone who has seen a jar of Coconut Oil knows that it is solid or semi-solid at room temperature (~22°C), as opposed to most common oils which are fully liquid at room temperature. And anyone who has kept a jar of Coconut Oil in their pantry, or lab, for a significant amount of time will know that it rarely goes rancid. And now we know that these two characteristics of Coconut Oil, solidity at room temperature and long-term stability, are directly determined by its fatty acid composition.

Let's look at one more example to close out our discussion.

Corn oil is another common oil but it has a fatty acid composition that is markedly different from Coconut Oil (Fig. 8).

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HISTORY OF OUR SOCIETY

Building a community and expanding knowledge for 75 years.

1945

Comprised of nearly 6,000 members, the Society of Cosmetic Chemists was founded in 1945 to promote high standards of practice in the cosmetic sciences. We serve as a focus and provide the proper forums for the exchange of ideas and new developments in cosmetic research and technology. Our leadership includes a long list of past SCC Presidents who have served the organization well over the years.

1948

Since 1948 Chapters have been the lifeblood of the Society of Cosmetic Chemists. We now have 19 Chapters throughout the United States and Canada, which conduct monthly meetings, educational seminars, suppliers' days and publish monthly newsletters. These Chapters are run by dedicated volunteers who lend their time and expertise to the smooth and efficient operation of each Chapter.

1999

At the turn of the century, our Society launched their first website with a mission to reach a larger audience while extending enhanced services to our membership. By digitizing our historic journals, we have an inventory of our evolutionary progress in developing new products based on sound standards.

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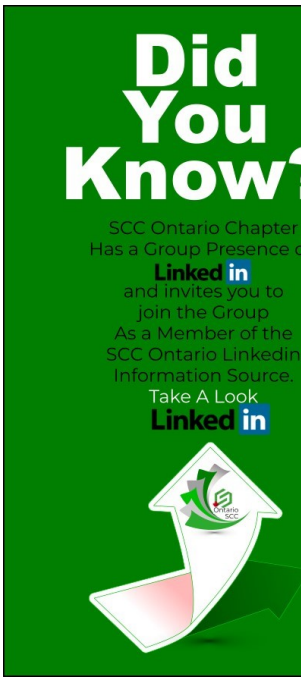
Presenters Wecome!!!

The SCC Ontario Chapter board is currently accepting submissions for presentations! Interested parties can submit a presentation abstract and a biography. Your talk may be accepted for either a Chapter meeting or Education Day.

Please send all enquiries to Andy Halasz (speaker coordinator) at

bhalasz39@gmail.com



NEWSLETTER POSTING DATES FOR 2021

Here are the dates for 2021 that the Northern Highlights Staff plan to post the 5 newsletters for the year;

- January 14th
- February 10th
- April 29th
- August 26th
- October 7th

(or as close as we can get)

Should posting dates change throughout the year the most up to date list can be found at;

http://www.ontarioscc.org/newsletters.htm

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Corn Oil Fatty Acid Composition	
Fatty Acid Chain Length	Percentage
Palmitic Acid C16:0	10
Stearic Acid C18:0	2
Oleic Acid C18:1	29
Linoleic Acid 18:2	56
Linolenic Acid 18:3	3

Fig. 8 – Corn Oil Fatty Acid Composition. Dominated by Linoleic Acid, a long chain, polyunsaturated fatty acid.

When we look at the composition of Corn Oil, we see that it is composed of only about 12% saturated fatty acids, and almost 60% polyunsaturated fatty acids. Thus, we should expect that it will have a relatively low melt point and should be relatively unstable against oxidation. And again, that is what we see. Of course, Corn Oil is liquid at room temperature, so its melt point is somewhat irrelevant for our purposes. However, we can instead talk about its freeze point, which is about -11°C. This is well below the freezing point of water. So, while Coconut Oil is typically solid at room temperature, Corn Oil will remain liquid well past the point of ice forming. That's a difference of about 35C degrees. Now we can really start to see how the fatty acid composition of different oils can affect their respective melting and freezing points.

Additionally, we can look at the oxidative stability of these two example oils. Corn Oil has a relatively low oxidative stability because it's high poly-unsaturated fatty acid content drastically increases its vulnerability to degradation relative to an oil like Coconut Oil. And if you've ever looked at the specification sheet of Corn Oil that is intended for use in a personal care or cosmetic product, you will likely see that it has some form of antioxidant added. This is necessary for the oil to maintain a decent shelf life. Whereas Coconut Oil will rarely, if ever, have an anti-oxidant added. (In the past, this would have been synthetic compounds like TBHQ, BHT, or BHA. However, as the market calls for more natural solutions we have seen increased use of Tocopherols and Rosemary Extract.)

The last point I'll make about these two oils is that they are not very compatible. That is, if you were to use them at equivalent levels in the oil phase of an emulsion, or an anhydrous product, they would not want to form a very stable, homogenous mixture. And this is again because of the differences in their fatty acid compositions. Their differences of medium chain versus long chain, saturated versus poly-unsaturated, and higher versus lower melt points do not allow for their triglyceride molecules to line up well with each other. They're different shapes and because of this they want to crystallize at drastically different temperatures. Because of this incompatibility we would want to choose one oil as the major portion and the other as a minor portion. Such that there is at least a 2:1 ratio.

CONCLUSION

Hopefully, this brief comparison of two common oils has given us some perspective as to how differences in triglyceride and fatty acid composition directly determine the unique characteristics of different oils and fats.

We could spend a lot more time getting into the details of what we've discussed here, as well as further comparisons of fats like Shea Butter or oils like High Oleic Sunflower Oil, but that will have to be for another time.

About the Author

Graduating with a Bachelor's Degree in Biological Sciences, Benjamin Schwartz began his career in Personal Care as a lab technician for The Estee Lauder Companies. After a move to the west coast, he spent 12 years as an R&D Chemist, and then Manager, for contract manufacturer Columbia Cosmetics. Through this experience, he has gained an intimate knowledge of personal care chemistry and formulations. Now having joined AAK, a global vegetable oil manufacturer, he brings this knowledge and insight to the world of plant-based lipids and their applications for personal care and cosmetics.

UPCOMING EVENTS

September 21st-22nd, 2021 On-Line Webinar 	SCC Ontario Education Day— Online CEP Course: GMPs for Cosmetics in Canada—Karl F. Popp, R. Ph
November 4th, 2021 On-Line Webinar 	SCC Ontario Chapter Meeting— "New Perspectives on Aging Skin" EMD Performance Materials— Howard Epstein, Ph.D.
November 26th, 2021 The Venetian, Vaughan Ontario CANCELLED	Annual Holiday Dinner Dance CANCELLED
February 3rd, 2022 The Venetian, Vaughan Ontario	SCC Ontario Chapter Meeting— TBA
March 10th, 2022 The Venetian, Vaughan Ontario	SCC Ontario Annual Regulatory Meeting— TBA
May 26th, 2022 The Venetian, Vaughan Ontario	SCC Ontario Chapter Meeting— TBA
July 2022 Caledon Woods Golf Club	TBA
September 22nd, 2022 The Venetian, Vaughan Ontario	SCC Ontario Education Day— TBA
November 3rd, 2022 The Venetian, Vaughan Ontario	SCC Ontario Chapter Meeting— TBA

ONTARIO CHAPTER SCHOLARSHIP PROGRAM SOCIETY FOR COSMETIC CHEMISTS

The support of Cosmetic Science Education and Research are central to the goals of the Society of Cosmetic Chemists (SCC). The Ontario Chapter has developed a Scholarship Program available to students planning to complete cosmetic science research in Canada. In the past, the $1000.00 award has been presented to students from Seneca College, University of Toronto, University of Waterloo, University of Guelph and McMaster University. The program began in 2003 and over 20 students have received awards.

Interested students are invited to submit a brief one page outline to Dennis Zuccolin, Director of Scholarships at dzuccoli@estee.ca. The scholarship applications will be reviewed by the SCC Ontario Chapter Board members. Students awarded a scholarship can also apply for additional support (up to $1000.00) to cover research and development costs, training and conference expenses.

The Ontario Chapter has supported the Seneca College Cosmetic Science Program and students by providing several scholarships. Students of the Seneca School of Biological Science and Applied Chemistry will also be supported with a new award starting in the current school year.

Successful scholarship and award candidates are encouraged to attend SCC meetings, volunteer at events, collaborate with members, prepare a poster presentation, write an article for the newsletter and make an oral presentation on their research at a chapter meeting.

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For those who would like to become members, yearly fees are $155 US. Applications are available from your Executive Committee or on-line at;
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Please return the completed form at your convenience and reap the benefits of the SCC. For renewal memberships, please send payments directly to the SCC National Office. For your convenience, National will accept payment by **VISA, Mastercard or AMEX**. Please contact National for details.

Presentation Library

Peruse our wide selection of presentations from previous meetings

http://www.ontarioscc.org/presentations.htm

ATTENTION MEMBERS

Unemployed and Emeritus members may continue to attend monthly meetings free of charge.
Please contact the registration booth upon arrival.

Unemployed membership is free of charge by submitting the renewal form with unemployment details.

Address Changes??

Throughout the year many of our members change jobs or relocate and forget to notify the National Office. Without notification, these members may not receive important mailings and eventually are made inactive. If you know of someone who has moved, please ask them if they have contacted the National Office regarding their address change.