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Presidents Message:

Today someone asked me **"What am I getting out of My ISCC membership? Why should I be working for the cause of Cosmetic industry through ISCC? What is the cause of ISCC?"**

This made me ponder over the questions and I realized that most of us do not know what we want from ISCC and what is it that ISCC is trying to do.

Today if we look at the Indian cosmetic industry, we can say that Indian cosmetic Industry is in a good position, we have good opportunities, the market is growing, consumer needs are changing, and new avenues are opening. But is it enough? Answer is No we have just taken a baby step towards the growth of Indian Cosmetic Industry. Today we have the potential to step into the next phase of the growth by equipping ourselves with the right tools of technology, knowledge and awareness.

Hence we at ISCC are trying to create the platform to deliver the right technology and create Knowledge platform for our members so that they can take the advantage to grow up the ladder. They can refer our Library as well as refer and download the books and research papers from KOSMET to gain more and more knowledge on the subject. Specially now when each one of us has to get equipped with the latest technologies and be in the forefront.

We at ISCC are also trying to bring the global industry to India by creating a Platform in the form of ASCS Cosmetic Conference in 2023 in India. This platform will be the most Ideal platform to network with the global industry as well as increase the growth potential by getting exposure of the latest technological advances. The ISCC members will be greatly at advantage during this conference.

With a future vision I would like to invite the industry to avail the opportunity by becoming the member of ISCC as well as extending cooperation to make this event a welcoming opening for the Global cosmetic industry in the creation of an Indian Cosmetic Trend globally.

Hence I would like to just sum up with request to all the members that please realize the treasure that you have by becoming the ISCC member and utilize the membership to the fullest not only by accessing the free books and research papers but also by extending your support to the cause of ISCC to help the industry grow to the next platform.

Cosmetics News in brief

· Flipkart group's fashion, beauty & lifestyle major Myntra, has announced its partnership with global lifestyle brand Marie Claire, to bring the latter's range of cosmetics and hairstyling appliances to India. Marie Claire is known for its salons, magazines, ready-to-wear and accessories segment. The new range by Marie Claire will also be available on Myntra soon.

· Beauty and fashion retailer Nykaa has filed a draft red herring prospectus for an IPO. It plans to raise Rs 4,000 crore from the IPO, which would value the company at $5 billion-$5.5 billion. Nykaa, which sells online and has 70 physical stores, plans to use the proceeds from the IPO for expansion, by setting up new retail stores and establishing new warehouses.

· Renee cosmetics, known for its innovative Fab 5-in-1 and Fab 5-in-1 Nude lipsticks. has launched FAB FACE ,a revolutionary 3 bullet stick product formulation designed to glam up eyes, cheeks and lips, with a single stick.

· Chennai based new age Skin care brand Minimalist has raised a Series A funding of Rs 110 crore from multiple international investors including Sequoia Capital India and Unilever Ventures in just nine months of its launch. The brand plans to utilise the funds to enhance its R&D capabilities and launch in global markets.

· Vedix , an ayurvedic beauty tech startup that uses AI and Ayurveda to design customised hair and skincare regime plans to strengthen it's position across geographies in India. The company claims to combining over 30,000 hours of intensive research, collaboration with experts and historical evidence on Ayurveda, herbal extracts and essential oils, to offer customers a hyper-personal remedy, backed by modern technology and the goodness of organic ingredients.

· Galaxy Surfactants has announced the launch of Galsoft SLL (INCI: Sodium LauroylLactylate), a 100% natural offering for the personal care industry.Galsoft SLL is a condensation product of lactic acid and lauric acid, and is a mild and multifunctional molecule. It is said to provide a foam profile, improved emollience, moisturization and sensorial properties in both leave-on and rinse-off formulations. The active can be used in skin care, hair care and baby care products.

· Gattefossé has obtained the ERI 360° label for three of its cosmetic ingredients: GatulineLink'n Lift, Gatuline Renew and EnergiNius. This label enables the entire life cycle of a product to be assessed from its origin through to its launch to market.

· The central government has issued a notification for ban on manufacturing, import, stocking, distribution, sale and use of single use plastic like earbuds, plastic sticks, balloons, plastic flags, candy and ice cream sticks from July 1, 2022. The thickness of plastic carry bags will be also increased from 50 microns to 75 microns from September 30, 2021, and to 120 microns from December 31, 2022. The notification does not offer clarity if sachets usedto pack shampoos , creams and sanitizers will also be banned.Indian Institute of Packaging (IIP) and Fragrance and Flavour development centre (FFDC) , both autonomous bodies under Government of India are offering a Six Months Online Certificate Programme on ‘Packaging & Processing of Fragrance ,Flavours & Cosmetics’. For course content, fees and other details, refer www.iip-in.com or www.ffdcindia.org

The Mexican Society, SQM, has announced that the extended dates of the 2021 virtual IFSCC Conference will be 18-28 October. For more information and registration details visit https://ifscc2021.org

ISCC & ECOCERT GROUP

presents

Online training session on Organic and Natural Cosmetics and COSMOS Certification

on 5th & 6th October 2021

Adapted Content:
- Each session with relevant topics

Strong Expertise:
- Internal Qualified Trainers

Interactive Sessions:
- Including concrete examples and Q&A sessions

What can you expect from this training?

Participants will get a deeper knowledge on COSMOS main requirements regarding ingredients, formula, packaging and labeling. The goal is to give every participant the appropriate tools and knowledge to be ready for the COSMOS Certification !!

What is the agenda of the session?

- COSMOS Standard: origin and content of the standard, ingredients (sourcing, composition, percentage) and formula requirements, packaging and labelling rules, marketing and communication;
- Clean Cosmetics, Selection of ingredients for the formulation, Natural content calculation and Therapeutic benefits of natural ingredients
- Certification Process: application form and subcontractor commitment rules, audit preparation (procedure, documents)

Who should be attending the training?

Anyone venturing into organic and natural cosmetics: Brand owners, Manufacturers, Raw Material Suppliers and Formulators.

What are the modalities?

- Online training will be conducted in English (on MS Teams).
- 2 sessions of 3 to 4 hours. The link will be shared for the sessions
- The 6 to 7 hours training session charged INR 12,000 + GST per participant.
- Special Discount for ISCC Members : INR 10,000 + GST per participant valid on or before 28th September 2021.
- **Hurry !! Limited Seats. Only 25 per batch.**

For registration please click : https://rb.gy/vtjmme

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Ecocert reserves the right to postpone or cancel the session at our discretion.

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ECOCERT COSMOS NATURAL

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Bio-ferments in Cosmetics

Vinay Kumar Singh Head-Formulation , Kumar Organic Products Research Centre Pvt. Ltd.

Fermentation is the transformation of a substance in the absence of oxygen and under the influence of micro organisms. Fermentation basically is an enzymatically controlled process that breaks down energy-rich compounds, e.g., carbohydrates, into other, simpler substances such as carbon dioxide and alcohol, or an organic acid. Micro organisms such as yeast and bacteria usually play a role in fermentation, as their enzymes decompose organic compounds.

Fermentation has been used in food for thousands of years. For example, yeast is used to ferment sugar in grapes to make wine, and bacteria are used to produce vinegar. In India too, we find in our mythological treatises about its application. Food like Idli & Dosa were prepared using fermentation. It is also an effective method to preserve food, which were very useful centuries ago, before the first fridges! Recently, fermented foods such as kombucha, kimchi, and kefir, became popular thanks to the public awareness of the importance of intestinal flora for general well-being and health. The virtues of fermentation within the human body are therefore well known. Now a days, the interest in fermentation has also started to reach skincare and cosmetics.

The cosmetics industry is always looking for innovation, and fermentation products, will likely become the world trend of tomorrow. While mankind has revived the ancient yet scientifically advanced concept of fermentation, it, in turn, can reinvigorate the glow and texture of skin, among other benefits.

The Global Fermentation Chemicals Market size is expected to reach $78.2 billion by 2025, rising at a market growth of 5.5% CAGR during the forecast period of 2019-2025.

Enzymes help to maintain our skin microbiome, the cutaneous microbial flora which consists of more than 500 different species of micro organisms that are multiplying every day on our skin. This phenomenon is crucial to maintaining good balance of the skin, by allowing it to be better protected against external aggressions. Because, the less varied the skin microbial flora is, the more unwanted pathologies including eczema or acne can set in. By forming a protective barrier against external aggressions, inflammation, infections and other skin diseases, the skin microbiome can, in the long term, help the skin to remain better and to be better protected. The microbiome is, indeed, an important part of the skin's barrier function and plays an essential role in the good health of the epidermis. A balanced microbiome means that the skin looks healthy, radiant and regenerates itself better. When it's weak and damaged, it can provoke dryness, sensibility, breakouts and other skin conditions.

Ferments in cosmetics help to stimulate the natural skin defences. They can also be used to purify acne prone skin, to help rebuild the skin barrier of the sensitized skin or to protect the skin from pollution thanks to their antioxidant properties. Their use has been known for many years in cosmetics, but what is more recent is the use of fermented natural ingredients, not just ferments alone. This is because fermented products are more potent, powerful, and super boosting when used in skin care products.

Fermentation has been regarded as both a traditional art and modern science. Bio-fermented products for the cosmetic and personal care applications employ the principles of fermentation, which allows for the isolation and concentration of various phytochemicals. The bioavailability of actives is increased by utilizing modern benefits of fermentation. For cosmetics, fermented ingredients are more symbiotic with the skin and support skin functions without disrupting natural processes making the ingredients less likely to cause sensitivity in skin care applications. Bio-fermented ingredients incorporated into beauty products can provide increased skin and hair affinity. By initiating fermentation, various cosmetic benefits, such as improved bioactive delivery, oxygen uptake, moisturization, and reduction in skin irritation, can be increased and made more readily bioavailable for skin and hair care applications.

The fermented ingredients also have anti-inflammatory properties. Thanks to the fermentation process, they become rich in enzymes, which are able to soothe and prevent skin inflammation. Basically, the enzymes eliminate the “bad bacteria” the skin may contain and replace them with “good bacteria”, this in turn helps to preserve the skin balance.

The use of both types of ingredients, ferments and fermented ingredients has a lot of advantages for the skin because they don't “work” on the same level. The ferments have an action on the microbial flora of the skin (which is on the surface, in the protective layer of the epidermis) and the fermented ingredients penetrate into the deeper layers of the epidermis and promoting its natural renewal.

With increasing Bio-ferments research, companies offer a wide and diverse ingredient portfolio that include includes Ferment Filtrates of the natural veggies with proven benefits. One of the key modern benefits associated with bio-ferments is that we can incorporate these active ingredients into beauty products because of its increased skin and hair affinity.

Bio-ferment filtrates are water soluble, hence are easy to incorporate in wide range of formulations of leave on & rinse of products in both skin care & hair care sector. Bio-ferments have unique healing properties to repair damaged skin.

Following are the properties of Bio-ferment filtrates for skin & hair

a. Antioxidant – the Bio-ferments are rich in antioxidant, enhances the free radical scavenging activities, thus delaying the aging of the skin.
b. Moisturising – Bio-ferment filtrates have immense moisturising properties thereby retaining natural moisture of skin & hair. They heal the cracks in the skin leaving the skin soft & smooth.
c. Vitamins – Natural vitamins in the ferment filtrates improves the texture of the skin & hair.
d. Minerals - In the maintenance of the skin, minerals play a major role. They maintain the texture of the skin, the elasticity & the firmness of skin, revitalizes the skin, balancing the cell activity.
e. Phyto-nutrients – reduces the photo damage, inflammation, oxidative stress & breakdown of extra cellular matrix of the skin.

While more and more Ferment Filterates are being worked on, the following Ferment Filtrates are currently available.

· INCI: Bacillus/Carrot root Ferment Filtrate
· INCI: Lactobacillus/Radish Root Ferment Filtrate
· INCI: B.subtilis and S.cerevisiae / Soya Bean

Ferment Filtrate
Fermented ingredients are now popular in the world of Cosmetics and Personal Care, thanks to the development of biotechnologies, opening up new horizons for these new favorite ingredients in the cosmetics industry.

SMALL PACK SIZE ingredients- WCC supporting the crucial market necessity

Covid 19 had a great impact on all business segments & economy. This has given rise to many new normal in beauty industry wherein the consumers as well as the manufacturers now make mindful investments in case of finished product or raw material procurement. Mindful investment not only relates to the cost but also considers various parameters like management of inventory, time, energy, possibility of success with no. of launches, low-risk, high-value ingredients etc .

Following these, there has been a tremendous increase in the demand for small pack size considerations for raw material procurement by manufacturers.

Major categories of specialty ingredients required by manufacturers

Categories	Issues with Conventionals	Our concepts - an edge over conventionals	In line with the Trends
SURFACTANTS	Harshness, dryness after rinse-off, leaves skin vulnerable to irritation	Amino acid based mild surfactants- types: anionic, non-ionic, ionic, cationic	Safe , Biodegradable, Sulfate free, mild yet effective cleansing, gives good foaming & conditioning
EMUSIFIERS	Instability over a period of time, restrictions with HLB & pH range	Natural origin emulsifiers - types: anionic and non-ionic with greater Salt tolerance & long HLB range, stable at wide pH	Safe, natural , sustainable, can be used comfortably with pH sensitive actives (examples - vitamin C & AHA formulations)
HUMECTANTS	underperformance, loss of formulation viscosity	Skin original moisturizers - prevention of Trans epidermal water loss (TEWL), improves skin elasticity ; maintains the original viscosity of formulations	Paraben Free; Well-ageing ; skin & hair essentials; long lasting moisturization
EMOLLIENTS	Imparts heavy feel & stickiness to the formulation : non- desirable	Natural origin - provides emolliency along with barrier damage repair & healing; ease of formulating	Beauty & wellness ; variety in Sensorials; minimalism
RHEOLOGY MODIFIERS	Restrictions with respect to compatibility with different ingredients from formulation	Rheology modifiers that not only work for water but also for oil, alcohol, polyols, silicones etc.	Transparency, possibility of creating various textured formulations; minimalism
UV FILTERS	Mostly organic type - associated to various health concerns	Aqueous dispersions of inorganic UV filters- non patchy; good water repellency	Safe, high SPF, PA values, excellent sensorials, one product for all skin types
OTHER FUNCTIONAL ACTIVES	Underperformance ; safety concerns; use of no. of ingredients for getting results	Plant proteins, natural extracts , vitamin C derivatives, scrubbing agents, anti-oxidants & a wide range of other functional actives that work on various therapeitic areas	Multifunctional, effective, Safe, Natural , Synthetic, hybrid

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NANOTECHNOLOGY IN COSMETICS: BOON OR BANE

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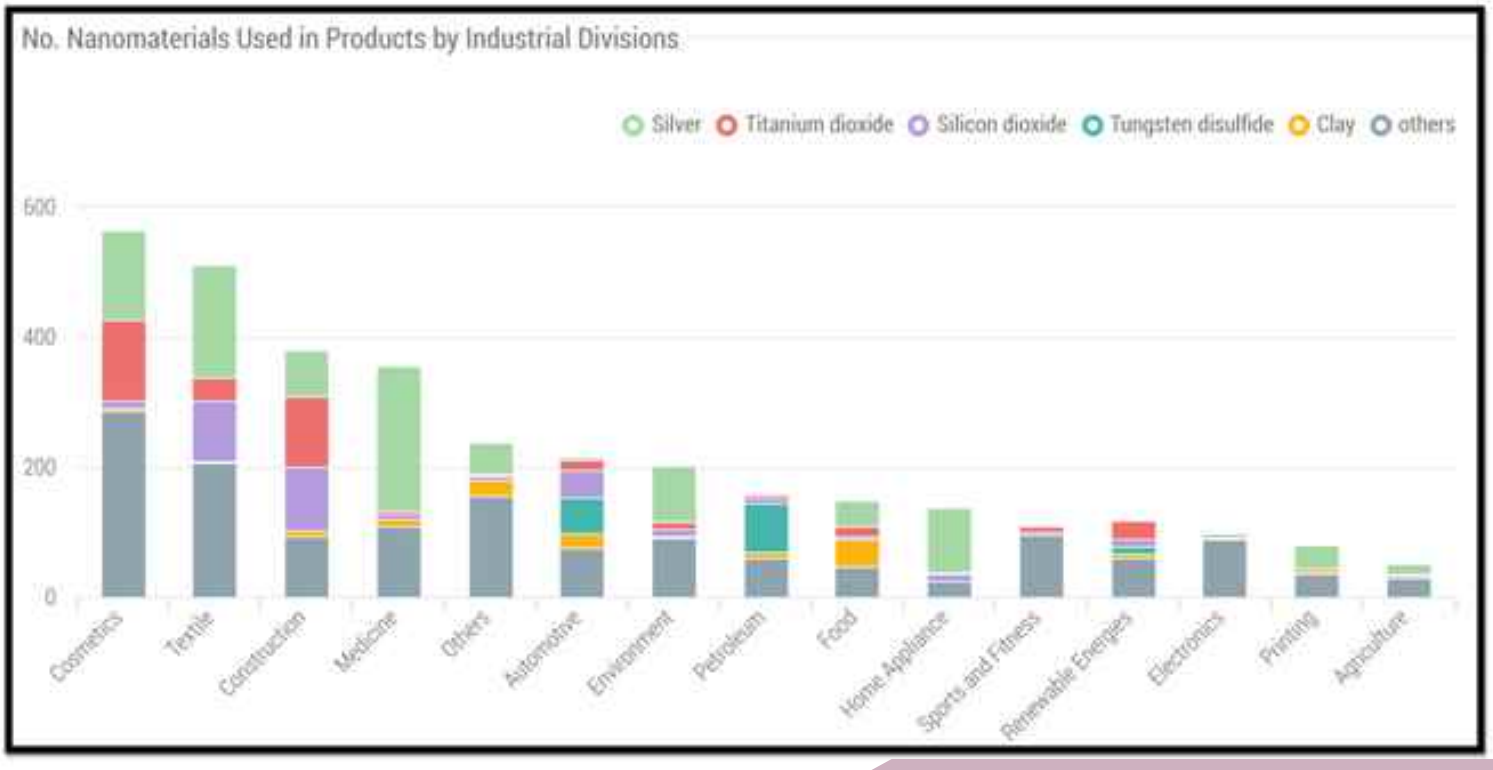
ABSTRACT :Nanotechnology has enabled almost all scientific disciplines; the field of cosmetics is no exception to this phenomenon. Cosmetics industry has played an active role in using these nanomaterials now for more than 30 years. The enthusiastic approach of the cosmetics industry has propelled vast amount of research concerning nanomaterials. However, being cosmetic products, it lacks the mandatory labelling and safety, efficacy tests unlike its pharmaceutical counterparts. Naturally, concerns regarding these issues have reached to the stringent most global regulatory authorities such as US FDA and EU. They have adapted their own sets of cosmetics regulations. The ever increasing amount of data and research regarding nano-cosmetics and regulation in the markets will have a pivotal role in deciding the future of the cosmetics sector. This paper seeks to discuss impact of nanotechnology in cosmetics, advantages of using nano-materials, safety of nanomaterials and about regulations due to their relevance.

INDEX TERMS :Cosmetics; Nanomaterials; Regulation; Safety; Toxicity

1. INTRODUCTION

Nanotechnology is considered to be one of the most prospective field of studyin the 21st century, and can be defined as the nano-scale formulation, characterisation and application of compositions, devices, and structures by domineering shape and size[1]. Nanotechnology holds enormous potential in the field of medicine, chemistry and environment, energy, information and communication, heavy industry, and consumer goods[2-5]. In the field of cosmetics, this novel technology possesses a promising potential[6].

The United States Food and drug administration (FDA) defines cosmetics as “articles intended to be applied to the human body or any part thereof for cleansing, beautifying, promoting attractiveness, or altering the appearance”[7]. Cosmetics are such products which are meant for external use and regulated along with drugs by regulatory bodies[8].



The official EU guideline defines nanomaterials in cosmetics as “an insoluble or bio- persistent and intentionally manufactured material with one or more external dimensions or any internal structure on the scale from 1 to 100 nm”[9].

The cosmetics industry has been among the first industries to use and implement nanotechnology based materials[10]. Nanomaterials have been used in the cosmetics industry for over 30 years[11]. The Statnano project cosmetics data shows us how other industries compare against cosmetics industry in nanotechnology. The figure helps us understand how how different industries compare to cosmetics industry in nano materials used in products

In this review, the use of nanotechnology in cosmetics is discussed, followed by the current safety procedures and testing practices. The recent status and advances in the regulations to the nanocosmetics are also discussed.

2. NANOTECHNOLOGY IN COSMETICS - THE BIG PICTURE

The use of nanotechnology in cosmetics sector can be best understood by looking at the marketed products and formulations. This sections discusses the use of nanotechnology in cosmetics.

2.1. ADOPTION OF NANOTECHNOLOGY PRODUCTS IN COSMETIC INDUSTRY

The first known marketed product using nanomaterial in cosmetics is Capture™ anti-aging cream which was based on liposomes was launched in 1986 by Christian Dior. L'Oréal S.A., which invests a great amount of revenue in nanotechnology, ranks sixth in the United States in the number of obtained nanotechnology-related patents[12], and uses up to four nano-ingredients (i.e., TiO2, ZnO, silica, carbon black) in some of their formulas[13].

Shiseido uses nano-TiO and ZnO in wet-based formulas(e.g.,emulsions),but does not use them in aerosols due to the risk of inhaling[14]. Procter & Gamble, Estee Lauder are also incorporating nanoparticles into cosmetics products[15]. The other major leaders in this field are colorescience, Revlon, Pureology, La Prairie, Neutrogena, Johnson & Johnson, Caudalie, Lancome, Chanel, Beyond Skin Science LLC, SkinCeuticals, The Body Shop, Dr Brandt, Prestige, Sircuit, Dermazone solutions, Crown laboratories, Birch trees, Nucelle, Skin Ceuticals, Rosacea Care, Image skincare, Almay, Barneys New York, Bellapelle skin studio, AmerElite solutions, AmorePacific, cell Rx, and Avon[6].

2.2. BENEFITS OF USING NANOMATERIALS OVER TRADITIONAL COSMETICS -

The use of nanomaterials and nanotechnology gives us significant advantages over the classical approach towards cosmetics. Some of the most important ones are listed here -

- Nanomaterials enhance the delivery of cosmetic ingredient into the skin. The small size makes material to be absorbed more readily into the skin.
- Nanoparticles of titanium dioxide and zinc oxide are effective blocker of UV radiation but also result in transparent formulation that is pleasing to the customer[6].
- Nanomaterials often have chemical or physical properties which may differ from those of their larger counterparts. Some of the proposed benefits that may occur by incorporating nanoparticles in cosmetics are increased efficiency, transparency, unique texture, protection of active ingredient and overall higher consumer compliance[6] .
- Main targets of using nano material in cosmetic could be efficient penetration into the skin for improved delivery of ingredient of the product such as new colour element in lipstick and nail polish transparency in sunscreen and long-lasting effect in make up.
- Greater skin retention, improvement in the stability of cosmetic ingredient, greater aesthetic appearance and sustained release of active drug for long-lasting effect are improvements over traditional cosmetics [23].
- The high surface area of nanomaterials allows for more efficient transport of the ingredients through the skin[16].

• The properties of nano-ingredients can be altered as per the specific requirements like targeted delivery, step-down stability problems, and enhanced aesthetics [10]. This helps in reconstructing nanocosmetics for many other functions including improved skin hydration, better skin incursion and enhanced bioavailability owing to their extraordinary or unique physicochemical properties.

• Some of the other anticipated benefits that can be expected from these tiny ingredients are better entrapment, better dispersibility, enhanced performance, improved textural quality, and protection of sensitive and volatile actives [8].

• Another added advantage is that these products look upmarket, elite and trendy at the same time.

2.3. TYPES OF NANOMATERIALS USED IN COSMETICS -

Among the various nanoparticles used in cosmetics some of the formulations are -

• Inorganic nanomaterial : (nano-)TiO2, (nano-) ZnO, (nano-)Ag, (nano-)Au, (nano-)Ti.

• Silica (nano-SiO2).

• Carbon black : CI 77266 (EU approved colorant).

• Nano-organic materials such as (nano-)Tris-Biphenyl Triazine, (nano)-MBBT.

• Nano-Hydroxyapatite.

• Gold & Silver Nanoparticles.

• Nanoliposomes, Solid lipid nanoparticles, Nanostructured lipid carriers & Nanocapsules.

• Dendrimers, Nanoemulsion & Nanopigments.

• Chitin Nanoparticles, Nanocrystal, Cubosomes & Nanosponges.

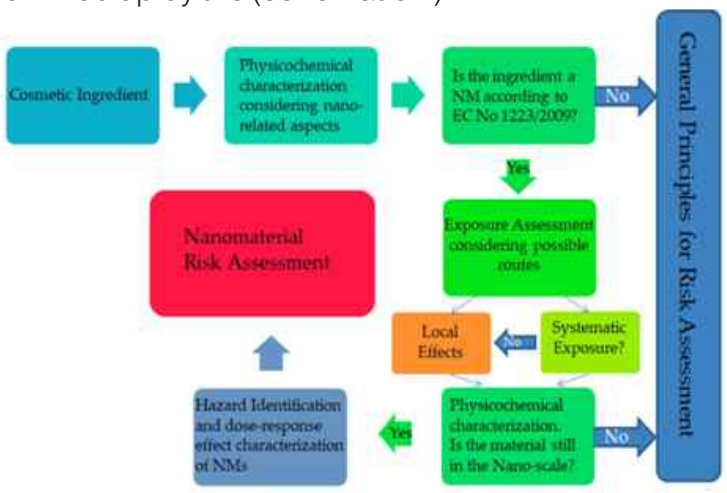
3. SAFETY CONSIDERATION AND TESTING

Cosmetics being not as regulated as pharmaceuticals may cause people to question the quality and efficacy of nanomaterials, which in tern causes panic; specifically the fears arising from the use of nanotechnology in cosmetics are due to concerns regarding possible genetic mutations due to chronic exposure to nanomaterials [8].

Concerns of ZnO, TiO2 particles entering the systemic circulation and showing toxicity led to many toxicity studies. The safety data which came out after almost a decade-long studies now available prove that these particles pose no obvious threat when used in sunscreen products [8]. It is also important to note however that the SCCP considers it necessary to review the safety of nano-sized TiO2 in the light of recent information and to consider the influence of physiologically abnormal skin and the possible impact of mechanical action on skin penetration[15]. Common routes of exposure for nanomaterials are inhalation, ingestion and absorption by skin and can cause local response to become systemic.

The FDA (USA), EMEA (EU) followed by Health Canada (Canada), TGA, and NICNAS (Australia) have started taking some initiatives in the direction of defining, classifying and designing regulations for the industry. FDA had initiated some investigations and eventually has come out with some inputs in the form of guidance through special characterisation and toxicity evaluations for the safety assessment of nanomaterials in cosmetic products.

SCCP has laid down some standards regarding the testing of the nanomaterials and they are best summed up by the (schematic 1)



Schematic outline for the nanomaterial safety assessment in cosmetics based (but modified) on SCCS (Scientific Committee on Consumer Safety), Guidance on the Safety Assessment of Nanomaterials in Cosmetics, October 2019, SCCS/1611/19

The brilliant paper by Jeswani, G et al. goes into depth in explaining the toxicity of various nano sized particles. While discussing toxicity, the paper states "Intrinsic andExtrinsic properties of nanomaterial like (i) zeta potential, (ii) size, (iii) coating materials, (iv) physicochemical aspects, (v) shape, and (vi) microenvironment, manipulate the toxicity of nanomaterials".

It is also of important to make a note of the conclusion the authors reached. The said paper points out that -

- Most cosmetics are applied on the surface of the skin and skin act as a strong barrier to penetration.
- Generally, skin cosmetics are used in very small quantity and others are rinse off (where the contact time is very less).
- Toxic potential of nanomaterial can be taken care of by adjusting the physicochemical characteristics like size, surface charge, functional group, and polarity.
- The results of toxicity assay largely depend on dose metrics and exposure route. The dose of the nanomaterials used in cosmetic products is not the same as used for the toxicity studies. Therefore, the obtained results cannot be directly extrapolated to cosmetic applications.
- Nanomaterials have been safely used in cosmetics since many decades with no critical adverse effects reported by the consumers. It therefore can be safely concluded that nanoparticles of various inorganic and organic materials can still be recommended for cosmetic purpose [17].

4. REGULATIONS

In India the Schedule M-II of drugs and cosmetics act of 1940 and rules 1945 Indian standard issued by bureau of Indian standards are the primary regulatory principles on cosmetic products.

In the United States, cosmetic products are not subject to premarket approval and regulatory authority for cosmetic lies within the federal Food drug and cosmetic act section 601 and 602 (federal food). Moreover, Section 301(a) forbids the marketing of adulterated or misbranded cosmetics according to FFDCA. US FDA restrains or provide limits for certain chemicals which may possess the risk of toxicity; e.g., zinc oxide [18]. In order to address the issue of nanotechnology and cosmetic FDA developed a separate guidance for safety of nano materials in cosmetic product which was published in June 2014 called guidance of for industry safety of nano material cosmetic products.

In the year 2009, the European "Cosmetic Regulation" was adopted. In EU, nanomaterials are also covered under REACH (Registration, Evaluation, Authorisation and Restriction of Chemical substances) [19], Biocidal Products [20], Food Additives [21]. European Union Observatory for nano materials EUON announced all companies that manufacture, use, import nano forms should have a REACH registration compliant.

One way to analyse the behavior of nanomaterials or materials at a nano-size range is to standardise it. The world's first reference repository for nanomaterials has been launched by European Commission's Joint Research Centre (JRC) for safety assessment testing by national and international standardisation bodies. The centre based in Ispra, Italy, has decided to hold about 25 types of reference nanomaterials initially, like carbon nanotubes, silver nano- particles, titanium dioxide, cerium oxide, and bentonite. The list will keep on growing with time, as and when the industry provides more reference samples.

Finally, the International Cooperation on Cosmetics Regulation (ICCR), established in 2007 [22], is an international group of cosmetics regulatory authorities from Brazil, Canada, the EU, Japan, and the USA, which meets on an annual basis to address common issues on cosmetics safety and regulation, including the use of nanomaterials in cosmetics. The ICCR provides a multilateral framework to maintain global consumer protection, by working towards regulatory convergence.

5. CONCLUSION

It seems that the era of nanotechnology in cosmetics is in full swing. The abilities of these nanomaterials have been of enormous help to the cosmetics industry. One cannot completely deny the potential dangers that are linked to some of the nanomaterials. But there is sufficient evidence to support the claim that nanocosmetics are relatively safe; along with that, they show novel properties that are of great importance to the user.

Undoubtedly the major conclusion is that "As the regulations, best practices and more research unfolds it will create massive boom in the cosmetics industry, and surely newer products will reach the shelves in our nearest drug store and will bring a beautiful, healthier, and safer future". Hence on the basis of all above evidences and studies, in my opinion the use of nanotechnology in cosmetics is a Boon both for industry and end-user.

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Sustainability is'the New Black' in CPC Packaging

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When it comes to cosmetics packaging, sustainability appears to be 'the new black' in the beauty industry as we are seeing a deluge of new 'clean' beauty product launches, zero-waste, circular economy and recyclability claims. From global players to start –ups built on eco-ethics; this movement has unleashed a huge demand on suppliers to satisfy customers for eco-friendly packaging and processes.

According to a senior packaging professional ,"A large segment of our customer base, ranging from the smallest entrepreneur to the largest multinational companies, have expressed a strong interest in finding primary packaging components for their new projects that are eco-friendly. Many of these customers have a personal interest and goal of moving forward with the most environmentally friendly primary packaging options. Others are being driven in this direction due to demands that are being put forward by their consumer base."

In many cases, global brands have led the way, pledging major commitments by 2025 for recycling, reduction, reuse, and lowering carbon footprints. Companies are also appealing to consumers' sense of 'doing good.' Corporate Social Responsibility (CSR) is also another aspect, with both brands and suppliers publicizing their corporate philosophies, as well as practices, spelling out internal policies from employee benefits packages, to manufacturing-based energy solutions.
In the past, eco-friendly packaging has been a 'nice idea,' but recently brands are spelling out from 'nice-to-have' into a 'must-have.' Social awareness has caused the change and we see brands searching for a way toward more meaningful sustainable packaging solutions.

The ultimate goal of sustainable packaging is to benefit society and the Earth and to provide brands with a compelling story to share with their customers who are expressing strong interest in conscientious, eco-friendly purchases. But while many brands have good intentions, the realities of what's possible and what's not are often complicated, due to issues such as cost, protection, formulation compatibility, a lux image and logistics.

First and foremost, all primary packaging options that offer an eco-friendly advantage must pass the litmus test for product containment, product protection, product compatibility, and efficacy in application. While the larger brands are aware of these basic packaging requirements and they factor them in, the smaller brands and start -ups need guidance to find viable options to meet their goals.

Always a resourceful industry, cosmetic packaging suppliers have engineered a strong variety of options for brands. Internally, while not every manufacturer has the ability to instantly go zero-waste, many are working to improve their operations in a responsible way, thus adding to a brand's compelling sustainability story.

Global research points to the changes taking place. Market analysts at Research and Markets report that the global cosmetic packaging market is expected to reach $3,980.81 million by 2026 growing at a CAGR of 5.9% during 2018 to 2026. While the major primary packaging materials considered within the scope of the study primarily include plastic, metal and glass, the organization says changes in materials used may lie ahead. According to the study findings, "Vendors have been observed to move toward adopting recyclable and eco-friendly packaging products due to growing environmental concerns among the consumers." The research group also noted the quandary that's been plaguing the use of greener materials for some time: "However, fluctuations in raw material prices are restraining the market growth."

But challenging as the situation is, there may not be a choice but to conform as a recent Mintel report, titled, Sub-Zero Waste: 2019 Global Beauty and Personal Care Trend points out, "If brands don't change their approach now, they won't exist in the future.

MossCellTec™ Aloe
Harmonizes the skin's moisture flow

MossCellTec™ Aloe is based on Mibelle Biochemistry's MossCellTec™ technology which allows for the sustainable large-scale production of *Aloina aloides* moss extract. This rare moss species has a high water retention capacity and it is also known as aloe-moss. MossCellTec™ Aloe improves cell-to-cell communication via connexin channels.

The issue

Dry air, cold weather, sun exposure, insufficient water intake, and aging can lead to dry skin and the consequent appearance of a rough skin texture and more visible lines and wrinkles. Lifestyle factors, such as caffeine intake and smoking, or the use of soaps with harsh chemicals and washing the skin excessively, can further contribute to the dehydration of the skin. Even people who are less prone to dry skin may suffer from dry spots on the skin, which are the result of an uneven distribution of skin moisture.

While we age, the cell-to-cell communication between the keratinocytes is impaired and it is more difficult for the epidermis to adapt to the environment. A reason is that the connexin function can be compromised during aging. Connexins are transmembrane proteins that form channels, connecting the cytoplasm of neighboring cells. The resulting gap junctions allow for the efficient transfer of signaling molecules and water between cells. A strong network of functional connexins is therefore necessary for efficient cell-to-cell communication within the epidermis and this allows for a synchronized skin response that keeps it healthy, resilient and moisturized.

The solution

MossCellTec™ Aloe improves the propagation of signaling molecules via gap junctions. This was demonstrated by an increased signaling velocity and enhanced final calcium signal in epidermal keratinocytes in an *in vitro* study. Clinical studies have shown that MossCellTec™ Aloe

- significantly improves skin hydration evenness by 14% after just two weeks and by 20% after four weeks
- significantly reduces wrinkle volume (13.1%) and depth (8.2%) after four weeks.

Therefore, by improving cell-to-cell communication in the epidermis, MossCellTec™ Aloe allows for a synchronized reaction of the skin, which is reflected by a harmonized distribution of skin moisture and an even skin texture due to reduced signs of skin aging.

The benefit

- Improves hydration evenness
- Activates cell-to-cell communication
- Fades away signs of aging
- Comforts dry skin

The plant

Compared to seed plants, mosses do not have roots and water transport systems. Instead, they absorb water directly into their leaves. Mosses can trap excess water and nutrients from the soil and air. *Aloina aloides*, known as "common aloe-moss", is a tiny dark green to reddish-brown moss measuring 2–5 mm in height. The rigid leaves form a rosette. Due to the similarity in the appearance of the leaves, aloe-moss was named after the *Aloe vera* plant. MossCellTec™ is a technology that enables the large scale cultivation of moss cells in sterile conditions and in both a reproducible and sustainable way.

INCI (EU/PCPC) Declaration: Xylitol (and) Caprylyl Glycol (and) Ketoglutaric Acid (and) Aqua/Water

Partnering innovation, adding value.

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