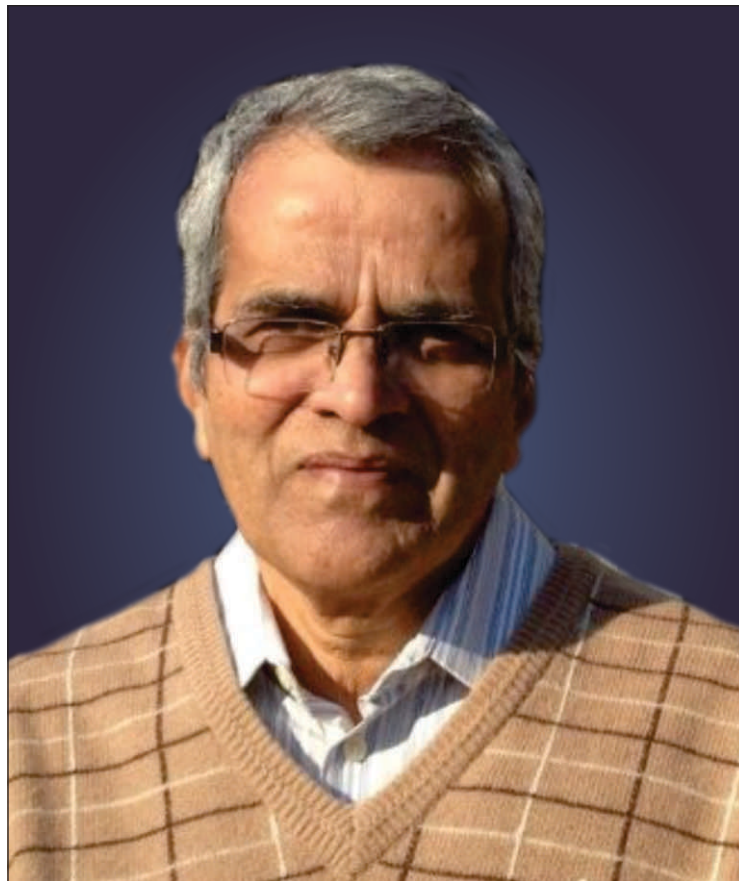


Tribute: Mr. Shivanand M. Shanbhag

We pay sincere homage to our Mentor Member Mr. Shivanand Shanbhag, a veteran in the field of Cosmetics. Mr. Shanbhag graduate from UDCT where he earned his B.Sc. (Tech) degree. Having joined Lakme in year 1969, he spent his entire career with the cosmetic company, rising steadily in the organisation from the post of officer to that of a General Manager. With his active support and innovative mind set, several local suppliers were encouraged to develop lab synthesized raw materials and conceptualize process technology & machinery. This spoon fed innovations went on to build prosperous businesses for these entrepreneurs. Following retirement, Mr. Shanbhag chose not to rest. He offered his experiences in the form of technical consultancy to many organisations and was often invited by several Colleges, Institutions and Universities to speak on various technical subjects. He was associated with various public institutions, educational and research institutes. He worked with the founder and first President of Indian Society of Cosmetic Chemist, Shri Govind. D. Kelkar to establish ISCC in India. In recognition and appreciation of his outstanding and consistent contribution to the development of ISCC, the Indian Society of Cosmetic Chemists, conferred upon him the 'Lifetime Achievement award' on Friday, 3rd March 2017.



Contents

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01. Tribute: Mr. Shivanand M. Shanbhag

02-03. HPCI 2020 New Horizons in Cosmetic Industry By Dr Renuka Thergaonkar

04-06. Orah VIT E: Tocotrienol Based Natural Antioxidant By ORAH Nutrichem Pvt Ltd

07-09. Fermentation Cosmetics By Mr. Vinay Kumar Singh

10-12. Glypure Cosmetic - Grade Glycolic Acid By Chemours

14. Benefits Of ISCC Membership

14. Certificate Course in Basics in Cosmetics by ISCC

HPCI 2020 New Horizons in Cosmetic Industry

By Dr Renuka Thergaonkar

Today's Cosmetic Industry with a market share of \$ 532 billion is at a rapid upward trajectory globally. In India it is growing at a very fast pace at the rate of 6% -20 % per annum. India is being looked upon as an interesting market. Over the last five years the demand for cosmetics in Indian market has increased by approximately 65%. Indian cosmetics industry is driven by the high personal disposable income of people, rising awareness towards well being, coupled with increasing demand for natural cosmetics.

The consumers involvement in ingredients and technology has led to major shift in marketing strategies in the Indian market. Even the manufacturing sector has not been left untouched by this involvement leading to a paradigm shift in the process outlook of the companies. The shift in market trends has created an opportunity for independent cosmetics businesses to apply creative solutions to the emerging customer demands.

According to market research firm Mintel, demand for personalised cosmetics is growing fast. Most of consumers like the idea that a beauty product is personalised especially for them and they feel that they give best results. More and more online beauty brands are increasingly using augmented reality to enhance the experience.

The new mode of online marketing is changing consumer's personal care product demands as providing end users with a real-time digital experience. More importantly, personal data captured through new digital touch points creates the opportunity to optimize future product offers. As customer data and profiling is becoming more important, more companies are trying to collect the data and use it for their benefit. Is this a challenge for the consumers or does it help them?

Conscious customers have led to focus on environmental sustainability in packaging. Till date the focus in packaging was more on practical and easy-to-use aspects as well as convenience and aesthetics for consumer attractiveness but now the marketed innovations are claiming to be sustainable either by their resources (bio-based) or their end of life (biodegradable) but without a full and fair assessment of their overall environmental benefit. Most of these eco-friendly innovations are questionable like materials,

renewable resources, compostability of the packaging and other aspects. New bio-packaging solutions with attractive shapes and sizes are coming in the market. Mushroom Packaging, Water capsules are new & innovative, 100% biodegradable replacement for plastics which are being made available in the market.

The brand-consumer relationship has shifted in a major manner leading the industry behaviour to become more information and emotion driven resulting in trends like "Clean Beauty" in skin and hair care products. The rise of the health-conscious movement within the beauty product market has been inundated by cosmetics promoting a healthier lifestyle. This includes making selective purchases on beauty care products based on the raw ingredients used, whether avoiding some components or being unsure about safety of some components or seeking those with more natural materials. Hence products with preservative free systems or alternative preservative systems are being created. Though preservatives are an integral part of formulations, the demand from the consumers have led to creation of alternative and preservative free cosmetics with huge claims.

Similarly the trend has led the formulators to revisit our traditional knowledge of Ayurveda and the traditional way of artisanal crafted formulations. Even ancient scriptures and mythological epics are being considered for the manufacturing and use of cosmetics for enhancing beauty. Kajal, Tilak, Agary and Alita were used for decorative purposes on the skin and the face, even during the days of ancient Gods and deities. Ayurvedic Cosmetics Formulations are being designed to provide best efficacious treatment for ailments and are being prepared by blending Ayurvedic herbs in particular ways to make cosmetic products with natural certifications.

The cosmetic products are being formulated after understanding the complete skin biology right from the circulatory system to the skin micro flora. The total microbial cell count in and on our bodies is similar to the number of human cells. The skin Micro flora is of two types mainly transient and resident skin flora. Resident microbiota are found in the upper parts of the epidermis and congregated in

and around the hair follicles. Gram positive and Gram negative are generally the transient bacterias on the body. The face itself has a wide spectrum of microflora residing in its various parts. Microorganisms can be grouped according to their relationship with us as Commensals, Symbionts and Pathogens. The microbes affect the skin pH and other aspects. This knowledge is now being used to form the Microbiome based cosmetic products.

Environmental protection, specially UV protection products have now changed tremendously. The structure and formulation of these products are being revisited leading to more organically crafted formulations designed with focus on the environmental pollutions and other aspects. Sun care formulations and their analysis has changed significantly with lot of emphasis on the skin type, analysis aspects, UVA protection & UVB protection. The industry is also facing challenges on the evaluation of the sun screening products.

With changing trends legislation is also becoming more stringent. The Biodiversity Act has started making its presence felt specially for the herbal extracts and cosmetics.

The Biodiversity Act was passed by the Lok Sabha on 2nd December and by the Rajya Sabha on 11th December 2002. The act is designed as the result of new developments in technology, in particular, biotechnology and information technology, and secondly the ongoing degradation of the environment accompanied by erosion of biological diversity. These developments show that all organisms are potentially resources of considerable economic value, worthy of efforts at conservation, scientific research, and of securing rights over the related intellectual property. The act emphasises on the sovereign right of countries of origin over their genetic and biological diversity. Resources and the acceptance of the need to share fair and equitable benefits flowing from commercial utilization of biological diversity resources with holders of traditional knowledge and practices of conservation and sustainable utilization of these resources.

The conference will also be providing knowledge through its workshops on Advanced skin evaluation and Hair texture creating formulations.

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Orah VIT E: Tocotrienol Based Natural Antioxidant

Awareness of the environment is vital for human well-being and the health of our planet. Consumer expectations are in a flux and the preference for natural and renewable products are creating a new market for strong growth.

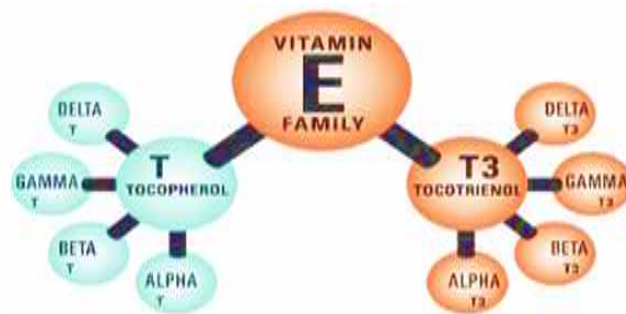
Personal Care products often contain free ions which could come from raw materials like fatty acids or tallow, from the water used in production or from manufacturing equipment or from environmental pollutants, UV rays etc. These ions in raw materials cause problems like rancidity, discoloration, precipitation and degradation of ingredients. To avoid these unwanted reactions, antioxidants like BHT, Tocopherol acetate etc. are used commonly in almost all kinds of Personal and Home Care products. Out of these in India BHT, Tocopherol Acetate, TBHQ are the most commonly used ingredients. BHT (butylated hydroxytoluene) is a lab-made chemical, a derivative of phenol which behaves as a synthetic antioxidant. Over the years, there has been much discussion about the use of BHT. While it is agreed that it is a safe material for use in cosmetics, there are some concerns about the usage levels and how this may affect the environment.

Similarly Vitamin E is also used as an antioxidant. The most predominant molecule in vitamin E family is alpha-tocopherol. Tocopheryl acetate is the ester of tocopherol. On a molecular level it is a tocopherol molecule with an acetate group added. It is more stable than tocopherol, giving products a longer shelf-life. Tocopherol acetate (α -Tocopheryl acetate), also known as vitamin E acetate, is α -synthetic form of Vitamin E. It is the ester of acetic acid and alpha tocopherol. It is not oxidized and can penetrate through the skin to the living cells, where about 5% is converted to free tocopherol. α -Tocopheryl acetate is used as an alternative to tocopherol itself because the phenolic hydroxyl group is blocked, providing a less acidic product with a longer shelf life. It is made by esterifying α -tocopherol with acetic acid. 2R, 4R, 8R-isomer, also known as RRR- α -tocopheryl acetate, is the most common isomer used for various purposes. This is because α -tocopherol occurs in the nature primarily as RRR- α -tocopherol.

When using BHT or Tocopheryl acetate in natural products many a time the question is asked about the origin of this material, whether we can use it in organic and natural products? Is it biodegradable? Is it sensitizing? Is it cost effective? Though used in a small percentage, these are some of the questions that a formulator needs to think over. Are there any Natural alternatives? And when this question arises, we end up thinking what could be the alternative that we could use.

This question has led to the search of Orah Vit E. Orah Vit E is a blend of Natural Tocotrienols in Medium chain triglycerides.

What are Tocotrienols? Natural Vitamin E is made up of



Tocopherols and Tocotrienols.

There are two classes of components in Vitamin E: Tocopherols and Tocotrienols.

The four Tocotrienols differ from Tocopherols by having double bonds in the tail of the molecule. The active chroman head structure remains the same as its analogous Tocopherol.

Tocotrienol is more potent than Tocopherols due to a significant difference in their chemical structure. The difference lies in the tail. The unsaturation (double-bond) in Tocotrienol makes it the more "aggressive" molecule; hence, it is more bio available. This difference in chemical structure makes Tocotrienols better suited for cosmeceutical and nutraceutical application in comparison to Tocopherols.

Figure 1: Molecular structure of Tocotrienol

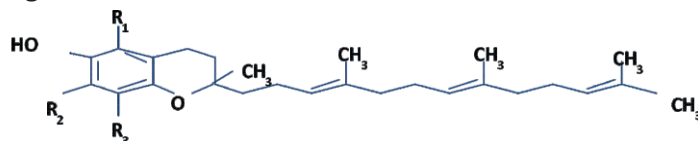
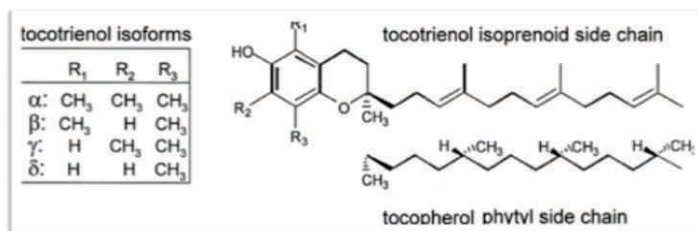


Figure 2: Molecular structure of vitamin E stereoisomers. Tocotrienols consist of a chromanol nucleus and a lipophilic isoprenoid chain. Tocopherols differ only in the side chain (phytyl). The naturally occurring isoforms, α , β , γ and δ , have methylation patterns as indicated.



Tocotrienols differ from the corresponding Tocopherols only in their aliphatic tail. Tocopherols have a phytyl side chain attached to their chromanol nucleus, whereas the tail of Tocotrienols is unsaturated and forms an isoprenoid chain. The various isoforms of Tocotrienol are Alpha, Beta, Gamma and Delta Tocotrienol. Because of these unsaturations in the isoprenoid side-chain, tocotrienols are thought to assume a unique conformation (Atkinson 2006). α -Tocotrienol seems to be very likely much more flexible in the sidechain and that it puts a greater curvature stress on phospholipid membranes. α -Tocotrienol possesses numerous functions that are not shared

by α -tocopherol (Sen et al., 2006). For example, nanomolar concentrations of α -tocotrienol uniquely prevent inducible neurodegeneration by regulating specific mediators of cell death (Khanna et al., 2006; Khanna et al., 2003; Sen et al., 2000).

The structural differences between tocopherol and tocotrienols result in a difference in the penetration of these compounds into tissues. The presence of three unsaturated bonds in the carbon side chain allows tocotrienols to penetrate tissues with saturated fatty layers, Tocotrienols are the primary form of vitamin E in the seed endosperm of most monocots α -tocotrienol stimulates ubiquitination and degradation of reductase and blocks processing of sterol regulatory element-binding proteins (SREBPs), another sterol-mediated action of Insigs. The α -tocotrienol analog is more selective in enhancing reductase ubiquitination and degradation than blocking SREBP processing. Other forms of vitamin E neither accelerate reductase degradation nor block SREBP processing (Song and Debose-Boyd 2006).

Unlike Tocopherol, the extraction process of Tocotrienol from the plant source is very complicated. Only a few companies have successfully mastered the process.

Orah Vit E as Antioxidant: Tocotrienols are reported to exert antioxidant effects by scavenging chain-propagating peroxy radicals. It works well as an antioxidant because it has the perfect shape—like a tadpole, similar to the phospholipids making up the cell membrane, with a head and tail. Tocopherols have a longer tail, whereas tocotrienols have a shorter, agile tail for heightened mobility. This small difference in molecular structure allows Orah Vit E tocotrienols to cover a larger surface area of the lipid more quickly, hence making them up to 50 times more effective as antioxidants to stop oxygen radicals from damaging fats and oils.

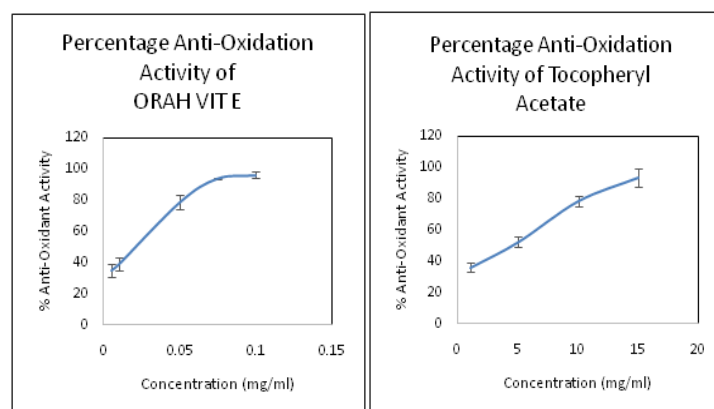
Tocotrienol, not tocopherol, administration reduces oxidative protein damage and extends the mean life span of *C. elegans* (Adachi and Ishii 2000). Tocotrienols are thought to have more potent antioxidant properties than α -tocopherol (Serbinova et al., 1991; Serbinova and Packer 1994). The unsaturated side chain of tocotrienol allows for more efficient penetration into tissues that have saturated fatty layers such as the brain and liver (Suzuki et al., 1993). Free radical scavenging effects of tocopherol and tocotrienols revealed that tocotrienols appear superior due to their better distribution in the fatty layers of the cell membrane (Suzuki et al., 1993).

Vitamin E interrupt free radical chain reactions by capturing the free radical (free radical scavenger); this imparts to them their antioxidant properties. Therefore, vitamin E protects the cells, with other nutrient (e.g. Vitamin C and Selenium) against the harmful free radicals formed during metabolism of fatty acids. The free hydroxyl group on the aromatic ring is responsible for the antioxidant properties. The hydrogen from this group is easily donated to the free radical, resulting in a relatively stable free radical form of the vitamin.

Orah Vit E is a Naturally Derived, Environment friendly, Highly Bioavailable strong antioxidant. It has excellent antioxidant properties.

1. Study of antioxidant properties: Anti-oxidants inhibit the formation of free Radicals. The Radical Scavenging activity by the DPPH Assay estimates the reduction of free Radicals. DPPH (2,2-diphenyl- Picryl Hydrazyl), a purple substance, is a stable-free radical in methanol. If the investigational sample has antioxidant activity, the odd electron in DPPH becomes paired with hydrogen from a free-radical scavenging antioxidant to form reduced DPPH-H. The color turns purple to yellow. The higher the intensity of discoloration, the more is the DPPH inhibition, which is detected Spectrophotometrically at 570 nm. The level of anti-oxidant activity of the investigational sample is compared to that of the internal positive control.

Sample	IC 50 Value (50% Reduction in DPPH)
Orah Vit E	0.021mg/ml
Tocopheryl Acetate	4.4mg/m



2. Study of Heat impact on Orah Vit E:

Oxidation is a major cause of the chemical breakdown of oil, but there are several other causes of degradation with potentially toxic effects. When oil contains more than specific levels of breakdown products, it is classified as rancid oil. The speed and level of breakdown products formed depend on the type of oil – the higher the amount of unsaturated fatty acids (polyunsaturated and monounsaturated), the higher the rate of breakdown.

The study was designed to determine the effect of heat on the pure Almond oil, Almond oil with BHT, Almond oil with Tocopheryl acetate, Almond oil with 0.2% of Orah Vit E. The samples were tested for changes in the chemical characteristics like acid value, peroxide value, Free fatty acid, Iodine value. The samples were kept at 180°C

Impact on Acid Value:

NAME OF THE SAMPLE	TIME INTERVAL				
	0 HRS (mgKOH/g)	2 HRS (mgKOH/g)	4 HRS (mgKOH/g)	6 HRS (mgKOH/g)	8 HRS (mgKOH/g)
Almond oil	1.1	1.68	2.17	2.8	3.2
Almond oil+ 0.2% BHT	1.08	1.40	1.68	2.22	2.8
Almond oil+ 0.2% Vit E	0.56	0.84	0.84	1.68	2.24
Almond oil+ 0.2% Tocopheryl acetate	1.1	1.68	1.92	2.17	2.45

Impact on Free Fatty Acid:

NAME OF THE SAMPLE	TIME INTERVAL				
	0 HRS (%)	2 HRS (%)	4 HRS (%)	6 HRS (%)	8 HRS (%)
Almond oil	0.42	0.70	0.95	1.26	1.77
Almond oil+ 0.2% BHT	0.41	0.55	0.70	0.97	1.26
Almond oil+ 0.2% Vit E	0.41	0.28	0.28	0.70	0.98
Almond oil+ 0.2% Tocopheryl acetate	0.41	0.70	0.82	0.95	1.11

Impact on Peroxide Value:

NAME OF THE SAMPLE	TIME INTERVAL				
	0 HRS (meq/1000 g)	2 HRS (meq/1000 g)	4 HRS (meq/1000 g)	6 HRS (meq/1000 g)	8 HRS (meq/1000 g)
Almond oil	4.5	5.24	5.86	6.32	6.98
Almond oil+ 0.2% BHT	3.98	4.04	4.36	4.8	5.12
Almond oil+ 0.2% Vit E	3.92	3.98	4.25	4.3	5.04
Almond oil+ 0.2% Tocopheryl Acetate	3.94	4.16	4.66	5.29	5.95

Impact on Iodine Value:

NAME OF THE SAMPLE	TIME INTERVAL				
	0 HRS	2 HRS	4 HRS	6 HRS	8 HRS
Almond oil	108.6	110.1	112.8	114.1	115.0
Almond oil+ 0.2% BHT	107.1	108.4	111.6	112.4	112.8
Almond oil+ 0.2% Vit E	106.5	107.3	109.3	109.8	111.3
Almond oil+ 0.2% Tocopheryl Acetate	108.8	109.3	111.2	113.7	115.2

Hence from both the studies it was observed that Orah Vit E has very high antioxidant property as compared to normal Antioxidants plus it also has better IC 50 value.

Safety Aspects:

Orah Vit E is considered to be non-toxic, non-irritating and non-cytotoxic in nature. This has been proved by various safety assessment tests performed on the product.

Uses of Orah Vit E:

It is used as an antioxidant in personal and home care industry. Apart from that it is also a good antioxidant for skin, it evens Skin Texture and Reduces Wrinkles. Increases moisturization. Brightens the product colour.

Availability in Market:

Orah Vit E is being manufactured in India. The Company providing Cosmetic grade Orah Vit E is Orah Nutrichem Pvt Ltd. This is the only company globally manufacturing natural Tocotrienol rich fraction for the cosmetic industry. All Orah Vit E data from Orah Nutrichem Pvt Ltd is supported with all the relevant technical data to support its application in Personal care and Home care products which is lacking with other companies. The product stands a COSMOS approval pending status.

Economic feasibility:

Generally, when we say naturally obtained or biodegradable the first aspect that comes in mind is high cost and its impact on the costing of final products. Orah Vit E is available in market at a price range of INR 4000 per kg. This will help in the development of formulations with natural and biodegradable claims at lower costs which is by far a difficult task.

Summary:

Orah Vit E is a natural blend of Tocotrienol rich fraction which can be used in Personal Care applications. It is naturally obtained and is a safe alternative to commonly used antioxidants. It readily biodegrades and is perfectly safe for the environment. It is non-toxic, non irritant and non sensitizing in nature. (It can be used in all types of personal care products and Natural products were claiming completely natural and biodegradable is a necessity.) It is also a cost-effective alternative to the existing antioxidants. It has strong antioxidant properties as compared to the other antioxidants because of its chemical structure. It is therefore advisable to use it in all types of conventional, and natural cosmetic applications replacing the synthetic antioxidants.

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Fermentation Cosmetics

By Mr. Vinay Kumar Singh

Before refrigerators, Korea developed fermentation techniques that enable food to be stored safely for long period. Many traditional medicines and cosmetics used by women at the royal court used similar knowhow. With interest growing in traditions of the past, there are now more cosmetics made using old techniques.

The latest trend in Cosmetics particularly Skin Care is fermented beauty products. This concept, originated in Korea, basically involves fermentation of natural ingredients like black tea, ginseng, seaweed, bamboo sap extract, red clove flower, hibiscus, snow lotus and various herbs and flowers.

Fermented Cosmetics are Cosmetics that use natural ingredients that have been fermented. Now, many of you may think that fermented ingredients are only for food, but in Korea, fermented rice/beans/corn/etc are one of the Korean skin care products. These do not have negative side effects, but instead it keeps skin healthy, strong, and smooth. Since fermented cosmetics use fermented natural ingredients, it is beneficial to all skin types including the sensitive ones.

Fermentation is the process in which a substance breaks down into a simpler substance. Microorganisms like yeast and bacteria usually play a role in the fermentation process, creating beer, wine, bread, kimchi, yogurt and other foods. It is the process in which microbes decompose organic compounds with enzymes in them. Organic compounds are the materials that produces energy to our body.

The word "fermentation" was originated from a Latin word "fervere" which means "boil", because bubbles may have been observed when alcohol was fermented to produce carbonic acid gas.

Human beings take organic compounds such as carbohydrates, deriving energy from oxidation of organic compounds which turn into carbon dioxide and water. However, microbes do anaerobic respiration, so they cannot fully decompose organic compounds. Instead, they produce different kinds of organic compounds that have less amount of energy. In the process of fermentation, organic compounds are decomposed to produce different kinds of organic compounds and provide small amount of energy to microbes.

Fermentation requires ferment bacteria such as enzyme and bacillus. Such bacteria decompose nutritional matters in

anaerobic environment to produce other matters which are byproducts as a result of imperfect decomposition.

The microbes decompose organic compounds that lay different characteristics are the two same processes. However, fermentation is different from decomposition. Fermented food has good flavor, edible taste and nutrition, while decomposition cannot be eaten due to bad smell and can cause a food poisoning. Of course, the two processes seem similar, but their differences are as follows:

First, the by products are different. The byproduct of decomposing cannot be eaten, while the byproduct of fermentation can be used as food.

Second, the processes are different. Putrefactive bacteria and ferment bacteria are of different kind. The activities of putrefactive bacteria produce bad smell due to amine and hydrogen sulfide. Putrefactive bacteria come to exist without exception when organic compounds are put in natural environment.

However, fermentation is generally triggered in specific conditions and environment. For example, Chinese cabbage would spoil with no special treatment, but it does not decay with salt treatment. Salt prevents putrefactive bacteria from activating and helps ferment bacteria to get stimulated. When salt-treated cabbage is stored in an appropriate container with the right temperature, ferment bacteria turns it into kimchi.

As such, specific conditions and environment are the main cause of fermentation. Another example can be found in the case of milk. Milk spoils with disgusting smell in normal temperature due to the activity of putrefactive bacteria. However, milk can be fermented to become cheese when it is placed with specific enzymes in certain conditions. The cheese-making process causes some kind of smell which is different from the smell of amine and hydrogen sulfide.

Fermented foods are known to be good for health. Korean foods such as kimchi have become famous in the world because of their health benefits. Many studies have proved that small molecules, the outcomes of fermentation, are beneficial for physiological function of our body.

Lactic acid bacteria and lactobacillus, contained in kimchi, stay in intestines of human body, functioning as gatekeepers. Naturally-fermented kimchi is effective in preventing food

poisoning bacteria (*Salmonella*, *Staphylococcus*, *Vibrio*, and pathogenic coliform bacillus) from growing.

The one that launched and made fermentation skincare a household name was none other than Japan's SK-II. The story of SK-II began at a sake brewery in Japan, where scientists noticed that elderly workers had wrinkled faces, but extraordinarily soft and youthful-looking hands. These hands were in constant contact with the sake fermentation process.

Five years of research, and the careful examination of over 300 types of yeast led to the discovery of Pitera, an ingredient that would become the keystone of the SK-II line, born in the 1980's. In fact, the signature Facial Treatment Essence is 90% Pitera. A by product of yeast fermentation, Pitera is a blend of vitamins, amino acids, minerals, and organic acids that protects, rejuvenates, and renews the skin. The Facial Treatment Essence is known to Asians as 'The Holy Water' or 'The Miracle Water'.

Another notable South-Korean fermentation brand from South Korea is Su:m37 by LG. Believing in "fermentation cosmetics" as the next growth engine in the industry, LG H&H launched su:m 37, Korea's first naturally fermented cosmetics brand. As Amore Pacific introduced Chinese medicine skincare to the market, LG aims to create a niche for naturally fermented skincare products. As is recognized, during fermentation microorganisms double active substances and break down molecular structure of substances to a size that is able to penetrate the skin more deeply and rapidly to boost the skin's natural defense. Fermentation attracts attention for its powerful ability to break down toxic substances.

LG H&H believes that fermentation technology will be a new growth engine that can reinvigorate a Korean cosmetic market already saturated with Oriental medicine-based cosmetics. Sales has been very encouraging and Su:m37 was a huge success in South Korea.

Amore Pacific then released their fermentation based skincare, Hyosia, in 2010 after the success of LG's Su:m37. Hyosiah is a fermentation skincare brand based on the fermentation of soybeans.

AMORE PACIFIC has focused on the skin effects of soybeans since the 1980s, discovering a rare isoflavone called 'CureBEAN™' from fermented soybeans through 25 years of

research. A rare isoflavone, CureBEAN™ has a powerful antioxidising function, and is effective at removing toxins from the skin and normalizing the skin's regeneration mechanism. Because of this, in August 2010, AMORE PACIFIC released a fermentation science cosmetic product called 'Hyosiah' comprising the relevant ingredients. There are many Japanese and Korean Fermentation Brands in the market.

Draco has made high purity bioactive compounds such as fermented glycerin, and with easy modification it is possible to make other substrates such as organic acids, flavor or perfume compounds, and even colors through the power of living yeast or bacteria cell cultures.

Organic acids are increased in many fermented foods providing a sour and flavorful note in the right balance with other constituents. Organic acids such as malic acid, fumaric acid, citric acid, and others are also well known Krebs cycle intermediates that help provide quick energy substrates to the energy producing mitochondria of the cells. They are known to chelate (bond with) essential minerals such as calcium, magnesium, zinc, copper and many others to thereby much improve bioavailability and decrease toxicity.

In seaweeds there is increased bioavailability of minerals through fermentation, and since seaweed is a wealth of mineral elements from the sea, accounting for up to 36% of its dry mass this can supply an amazing natural mineral supplement. The mineral macronutrients in kelp include sodium, calcium, magnesium, potassium, chlorine, sulfur and phosphorus; while the micronutrients include iodine, iron, zinc, copper, selenium, molybdenum, fluoride, manganese, boron, nickel and cobalt. Fermenting seaweed releases minerals from cell walls and makes them more soluble and easily absorbed.



For gastrointestinal health it is a source of prebiotics to promote the growth of healthy bacteria and promote regularity. Bioactives in fermented kelp include fucoidan, beta glucans, laminarin, short chain fatty acids, and shorter chain polysaccharides. For skin health fermented sea kelp has soothing, hydrating anti-inflammatory effects.

With so much evidence that fermented foods and the enzymes they contain are essential for a healthier body, we knew it was only a matter of time before beauty companies harnessed those ingredients for healthier skin. Fermented cosmetics are currently all the rage in Korea.

Koreans eat fermented foods like kimchi in order to improve health and beauty from the inside out, and they love that the same natural ingredients are now in their topical creams. Many celebrities credit fermented skin care with giving them a bright and youthful complexion."

The most common ingredients in skin care that undergo fermentation are fruits, plants, herbs, and yeast. The process breaks down the molecular structure of the ingredients and actually makes the nutrients more concentrated and more easily and rapidly absorbed. It can also produce additional skin-loving amino acids and antioxidants. Korean brand Sulwhasoo, incorporates fermented white and red ginseng into many of its products. While the intestines produce enzymes, the skin does not. So, enzyme process is used to transform the active ingredient of ginseng to be more easily absorbed and functional. Better skin affinity means better results.

Immunocologie, a new American skin-care company also use fermentation technology. Not only are fermented skin products more potent than their non-fermented counterparts, but they're also better suited for sensitive and dry skin. Fermented cosmetics are more symbiotic with the skin. It mimics the skin's cell functions and supports the skin without disrupting its natural process, so it's less likely to cause sensitivity. Sugar and fruit acids, which are abundant in naturally fermented ingredients, also help to moisturize. Fermented active ingredients provide a sort of protection for the skin and strengthen the skin's metabolism to make it stronger and healthier.

For cosmetic and personal care products, fermentation technology can help generate sustainable/green, ecological friendly organically certified and naturally-derived ingredients. Draco has already developed an organic

certified glycerin from organic corn using a living cell derived process. Similar cosmetic bio-actives such as sorbitol, glycols, and organic acid can also be made without the need for petroleum or petrochemical as starting material for cosmetics.

Other areas of new product development include bioconversion of fragrance to water-soluble natural fragrance, high bioavailability actives, and bio-actives for anti aging, whitening, anti-inflammatory, moisturizing, and UV-blocking effect.

Cosmetics industry is always looking for innovation and Fermentation technique is well accepted in Korea as beauty trend, it will be the trend world over tomorrow. Mankind has dug out an ancient but very scientific concept of fermentation. These fermentation products help the skin re-texturise, glow and other perceivable benefits.

Precision Fermentation is the cutting edge of extraction, enhancing bioavailability, flavor, and performance beyond normal limits. Now you can customize it for your specific botanical, formula, or blend ingredient.



Glypure

Cosmetic-Grade Glycolic Acid



Your Choice for High Purity Glycolic Acid

Glypure Cosmetic-Grade Glycolic Acid in Anti-Aging Skin Care Formulations

In skin care formulations, active ingredients may come and go; but over the years, few, if any, have been as beneficial for consumers as glycolic acid. Proven effective for use in creams, toners, cleansers, moisturizers, peels, lotions, and other products for more than 20 years. And, when it comes to high quality sources of glycolic acid, Glypure glycolic acid delivers a host of valuable advantages, including outstanding product consistency, high purity, exceptional reliability of supply, purely U.S. sourcing, and expert Chemours technical support.



Glycolic Acid: One product, multiple benefits

Enhancing exfoliation, alleviating dryness, improving cell differentiation, stimulating collagen production, evening out pigment, minimizing fine lines and wrinkles, mediating sun damage, increasing elasticity, improving skin thickness, creating a smooth and radiant appearance no other active can deliver the diversity of beautifying, anti-aging benefits that glycolic acid has provided to consumers for decades.

For example, in a double-blind vehicle control study of photo-aged skin treated with 50% glycolic acid, results showed a decrease in rough texture and fine wrinkling, fewer solar keratoses, and a slight lightening of solar lentigines (age spots).¹ A statistically designed study of 65 patients treated with 15% glycolic acid for six months, skin thickness increased 27% over control ($p < 0.01$), even greater than the effect induced by 0.01% estradiol applied similarly.² And a clinical study confirms that glycolic acid treatment increases type 1 collagen mRNA and hyaluronic acid content of human skin, after a treatment regimen consisting of 20% glycolic acid lotion applied twice daily for three months.

In addition, glycolic acid has also been shown to improve the penetration and enhance the activity of other therapeutic agents, making them even more effective for the consumer. For example, a study has shown that glycolic acid included in benzoyl peroxide-based acne gels can generate improved results.⁴ Likewise, glycolic acid can improve the results provided by hydroquinone and kojic acid in the treatment of melasma, the dark skin lesions resulting from over exposure to sunlight.

Glycolic Acid: Fastest absorption

Of all skin care actives, the glycolic acid molecule is the smallest; at just 76 g/mol, it's even 15% smaller than lactic acid, and about one-quarter the size of the big molecules like retinoids and peptides that can be frustratingly slow to penetrate the skin. Built in to your products, glycolic acid can help you deliver the outstanding ease and speed of absorption that your customers expect.

Glycolic Acid: No color, no smell

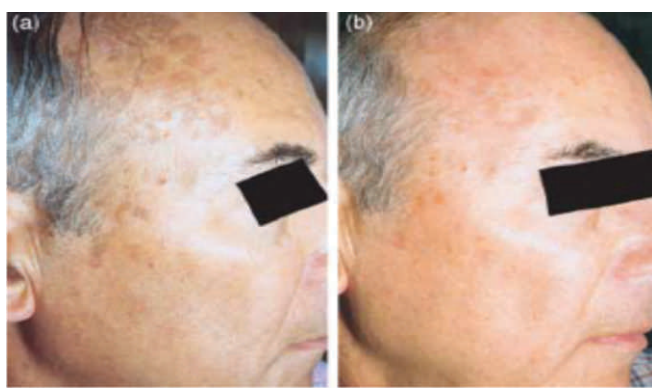
While the technical grade for glycolic acid has a yellowish tint, high purity glycolic acid is clear. So, you won't have to override the yellowish tint found in lower quality lactic acid and retinoids that can impart an off-color, impure appearance to your products. And, when formulating with glycolic acid, you won't have to incur extra time and cost to mask unpleasant odors that can sour carefully selected fragrances, as can happen when using a lower quality lactic acid.

Glycolic Acid: Excellent value

With so many benefits at a highly competitive price point, glycolic acid can be of superior value in any skin care formulation. In addition, glycolic acid no longer has associated licensing fees in most regions, and the few remaining will expire in 2015, making the value proposition of glycolic acid even more compelling than ever before.

Glypure glycolic acid is the industry leader and ideal choice for optimum performance in nearly any skin care formulation.

Heres why:

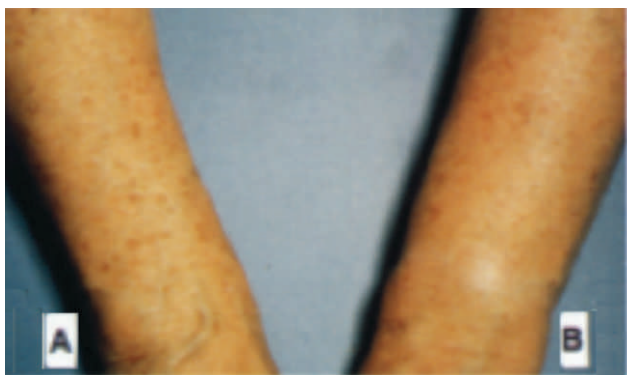


"Age spots," including multiple lesions of seborrheic keratoses and lentigines, in a 64-year-old man, before (left) and after (right) topical 10% glycolic acid and 2% hydroquinone cream twice daily for 9 months

"Alpha-hydroxyacids and carboxylic acids

Ruey J. Yu, PhD, OMD

Eugene J. Van Scott, MD



Forearms of a 65-year-old woman after 6 months' twice-daily applications of vehicle control to the right forearm (A) and 20% glycolic acid lotion to the left forearm (B). Abatement in dyspigmentation of the left forearm is evident from fewer, less distinct solar lentigines.

Alpha-Hydroxyacids in the Treatment of Signs of Photoaging

Eugene J. Van Scott, MD

Cherie M. Ditre, MD

Ruey J. Yu, PhD, OMD

Glypure glycolic acid: Unmatched product consistency and reliability

Chemours is the only glycolic acid supplier to manufacture the product completely in the United States, and the only one to use a continuous process for optimum product uniformity, avoiding the batch-to-batch inconsistencies common to other sources. In fact, the Chemours manufacturing facility in Belle, West Virginia, is ISO 9001:2008 certified and produces glycolic acid continuously, 24 hours a day, seven days a week. Continuous manufacture using dedicated equipment also helps avoid the contamination issues that can plague batch processes. In addition, the combination of U.S. sourcing and continuous production helps ensure you consistent reliability of supply, unmatched by other glycolic acid suppliers.

Glypure glycolic acid: Outstanding product purity

In recent tests, Glypure glycolic acid samples had no detectable levels of chlorides, whereas samples from other suppliers demonstrated levels as high as 713 ppm. In addition, and regardless of claims to the contrary, nearly all glycolic acid has some detectable levels of formaldehyde; Chemours samples in all grades demonstrated levels in single-digit parts per million in some cases, even lower than the levels found in samples of glycolic acid that claimed to be formaldehyde-free. Several of the samples also had measurable quantities of halogenated organic compounds, and some had more than 100 ppm of dichloroacetic acid (DCA), listed as a California Prop 65 carcinogen and male reproductive toxin, and IARC 2B, listed as a potential human carcinogen. Chemours samples had no detectable levels of either of these contaminants.



Face of a 24-year-old woman with acne at (left) baseline and (right) after three peels administered during a 2-month period. Peels consisted of 20% mandelic acid plus 10% citric acid booster peels, followed by application of glycolic acid peel solutions of 20%, 50%, and 70%, respectively.

Clinical and cosmeceutical uses of hydroxyacids

Barbara A. Green, R&

MS Ruey J. Yu, PhD, OMD

Eugene J. Van Scott, MD

Glypure glycolic acid high purity, cosmetic-grade glycolic acid for the finest skin care applications

Glypure glycolic acid: Industry-leading technical support at your service

Chemours customers have access to a highly experienced U.S.-based team of technical service representatives, R&D technicians, formulating chemists, analytical chemists, and other glycolic acid professionals. They can assist you with new product development and formulation optimization, helping you maximize product effectiveness and reduce your time to market, as well as help you troubleshoot and optimize success at any stage of production. To further help you succeed, Chemours offers a wide variety of personal care starting point formulations using Glypure Glycolic acid. These include anti-aging serum, night cream, day cream with sunscreen, anti-acne cream, peel-off mask, skin lightening cream, and dozens more. We are constantly adding to this list to meet continuously changing needs in an innovative industry, and we can work with you to create a custom starting-point formulation to help jump start your product development efforts.

Glypure glycolic acid: Three different grades to best meet your needs

Glypure glycolic acid is available in three grades to help meet any formulating and production need:

Glypure 70 glycolic acid is a purified liquid suitable for use in most high quality creams, lotions, and other common skin care applications.

Glypure 99 glycolic acid is a highly purified crystalline powder of +99% purity. It is perfect for applications like powders and cleansers or in formulations that are anhydrous in nature.

Pre-neutralized Glypure glycolic acid is an aqueous solution pre-neutralized to your specifications, helping you avoid the use of ammonium hydroxide or sodium hydroxide in-house. Several pH levels are available from 2.25 to 4.4, and custom pH varieties are also possible.

Build in quality to your next skin care formulation choose high purity Glypure glycolic acid

With the skin care products arena so competitive, it makes sense to use one of the most proven, most effective, most versatile anti-aging actives glycolic acid. And, it makes sense to specify the purest, most consistent, most reliable, most supported glycolic acid available. Glypure glycolic acid is the industry leader for a reason. Contact us today to find out more about putting high purity Glypure glycolic acid to work in your formulation.

Anti-Aging/Face Care

Professional Anti-Aging Serum
Day Cream with Matrixyl
Anti-Aging Serum
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Anti-Acne Cream with AHA and BHA
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Face Cream with ProVitamin A
Night Cream
Rinse Off Facial Mask
Anti-Acne Toner
Exfoliating Face Scrub
Revitalizing Peel (30%)
3 in 1 Cream Gel

Skin Lightening

Hydroquinone Skin Lightening Cream
Skin Brightening Gel with Kojic Acid

Mens Care

Mens Daily Moisturizer with Sunscreen
Mens Foot Cream
Mens All in One Hair and Body Wash
Mens Facial Toner (Wipes)
Razor Bump Treatment

Skin Care (Miscellaneous)

Self-Tanning Remover
Stretch Mark Cream
Cuticle Cream

Hair Care

Clarifying Shampoo
Shampoo and Scalp Treatment
Leave-In Conditioner
Conditioner
Conditioning Treatment

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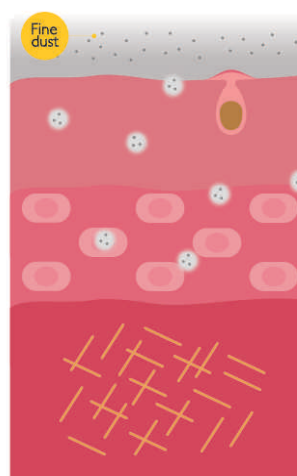
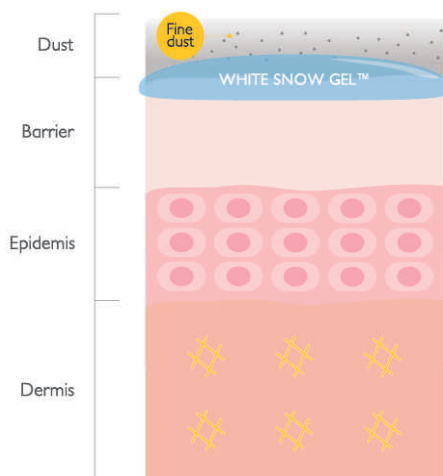
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At Indian Society of Cosmetic Chemists we not only help you to grow your network with industry professionals but also help you to grow yourself in terms of knowledge, experience and exposure. We help you to learn

- * By encouraging Research, Development and Training in areas related to cosmetics by organizing talks, seminars, conferences and educational programs where in Industry stalwarts around the globe pitch in to deliver the talks.
- * To encourage Technology development in the overall areas of this industry. The society helps in understanding and arranging specific courses for the professionals to help them learn new technology.
- * To promote the competence and integrity of those involved in the C&T industry.

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- Formulation of cosmetics
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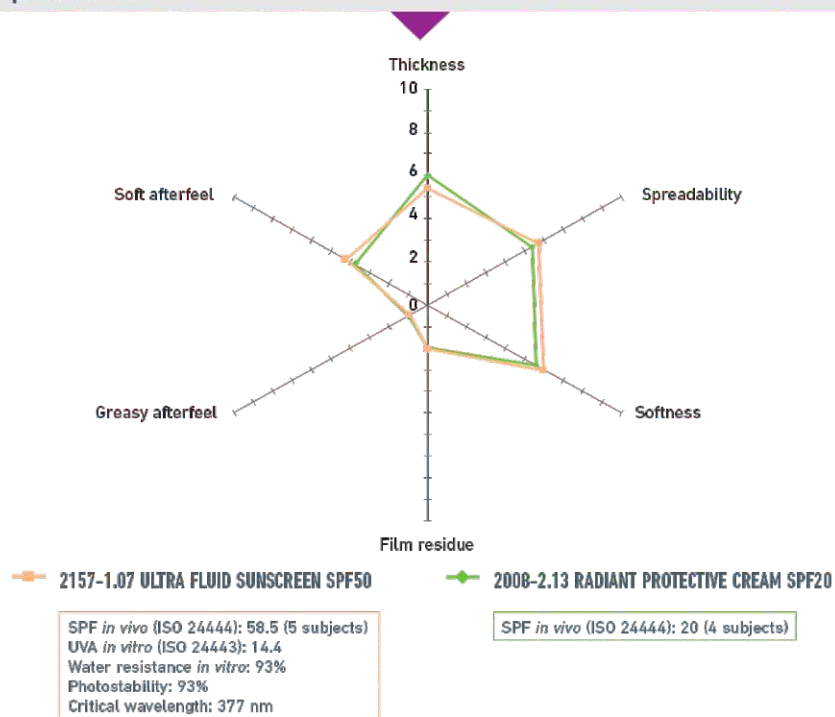
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