



Formulate is an annual event when cosmetic ingredient suppliers exhibit their latest introductions and make brief presentations to an audience of formulating chemists. This is a brief overview of a selection of those presentations.

Trends in cosmetics and the ingredients used to satisfy them are always a popular subject at Formulate. Valeria Vergani, **IMCD**, introduced new innovations for 2017 and said that anti-pollution cosmetics to protect consumers from damage in the urban environment was to be a major trend in 2017. Consumers also suffered from stress and exposure to chlorine, blue light and infra-red radiation. Vegani looked at these problems in more detail and suggested ingredients from various sources that could be employed to give an urban detox! Arnita Wolford, **Univar**, stressed that consumers look for the WOW factor and found it in sensory experiences and that texture is part of innovation. Products that changed from powder or gel to water or those that changed from clay to foam were highlighted and Worford introduced PISTE. Packaging attracts attention; Ingredients bring innovation; Story captivates; Texture creates desire; Efficiency increases the chance of a repeat purchase and PISTE separates mass from prestige.

Luxury is defined as a state of great comfort or elegance, especially when involving great expense, said Ella Ceruala, **Cornelius Group**, who explained the difference between luxury cosmetics and “masstige” (mass prestige) products with (at least) some feeling of luxury. Sleep is the ultimate luxury and luxury bed linen companies are launching sleep skincare and sleep enhancing beauty drinks. Time is also a luxury and fast acting cosmetics including 11 minute LED facials at Harvey Nichols, Korean splash masks and in-shower tanning products were described. Felix Wilson, **Aston Chemicals**, suggested that consumers were looking for instant effects and interesting textures. An immediate sensory or visual cue is ideal in conveying product efficacy and this may be used in combination with active ingredients, providing long and short term solutions. If the product also has an interesting texture, even before consumers have felt the longer-term benefits of the products, they have experienced something new, exciting or pleasing. Other trends identified by Wilson were food inspirations and the continued rise of BB creams, which are now targeted for body and legs as well as face.

Sensations were also an important part of the **Azelis** presentation asking why sensation matters so much before describing how we use touch, sight, smell and taste to experience sensations. Materials that appeal to these senses were presented although regarding taste, it was more a matter of rendering lipsticks tasteless by

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Formulate 2016
1st published in SPC 2016
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substituting LexFeel 700 [INCI: Polyester-4] with emollient, humectant pigment dispersing properties as an alternative to castor oil.

Providing sensory experiences was a frequent theme at Formulate and these could be provided by products that changed consistency during application, changed colour over time or featured heating and cooling benefits. To simplify formulating textures and providing the desired sensory feel **Evonik** developed an on-line tool named Sensory Kaleidoscope and described by Jürgen Meyer. Generally, sensory attributes are plotted on radar charts but they can be confusing. Based on the effect of emulsifiers Evonik reduced multiple variables to a more compact group of four; measuring high and low absorption and light and rich feel. The Sensory Kaleidoscope is available on line to registered users of the Evonik web site.

The secret behind creating novel cosmetic textures is very dependent on the rheology modifier that is used and Anne Thomasson, **Solvay**, described the rheological properties of Rheomer SC Plus, [INCI: Acrylates/beheneth-25 methacrylate copolymer], which is supplied as a preservative-free liquid emulsion. It is electrolyte tolerant, stable over a pH range of 6.5 – 9 and has excellent suspending power. It can be used to stabilise O/W emulsions without the need for an emulsifier and sensory evaluation results show that it is preferred over carbomer-stabilised emulsions because emulsions are absorbed faster without any tacky after-feel.

The agony of choice was the title of a presentation by Berned Heinkin on behalf of **Schülke** in which he discussed the options available to protect cosmetic formulations against micro-organisms. Heinkin discussed the rising use of multi-functional actives, whose primary purpose is not the inhibition of microbial growth albeit this was a side effect of their use. Schülke has created three mixtures to help formulators select the optimum one for their formulations while satisfying the demands of the marketing department. Euxyl K903 is a mild system comprising benzyl alcohol, benzoic acid, dehydroacetic acid, tocopherol; Euxyl K 940 is a mix of phenoxyethanol, benzyl alcohol, ethylhexylglycerin and tocopherol and Sensiva PA 40 is a synergistic mixture of phenylpropanol, propanediol, caprylyl glycol and tocopherol. The advantages and limitations of each mixture were discussed and antimicrobial efficacy test results shown.

Continuing the preservative theme, Markus Schroder, **Cosphatec**, presented Cosphaderm POP as a novel water-soluble multifunctional ingredient with strong antimicrobial efficiency. It is a blend of propanediol, caprylyl glycol and phenylpropanol, Propanediol works as a moisturiser, conditioning agent and booster for improved antimicrobial properties. Caprylyl glycol is a moisturising conditioning agent and emulsion

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stabiliser and has, in combination with phenyl propanol, a strong efficacy against bacteria, yeasts and moulds.

Andrea Wingfield, **Ashland**, described hurdle technology and improved delivery systems to maximise preservative efficacy. The delivery of preservative actives is key to their antimicrobial activity., said Wingfield. The preservative must reach and interact with its antimicrobial target to be effective and the right delivery system enhances the preservative activity in the aqueous phase or at the aqueous-oil interface. Two preservative systems were then described: Optiphen DP [Benzoic acid, dehydroacetic acid, propanediol, propylene carbonate] and Optiphen DLP [Dehydroacetic acid, propylene carbonate] that each have global approval. Comparative efficacy test results were shown and it was also shown how caprylyl glycol or 1,2-hexanediol further enhances their efficacy.

To care for the skin requires an understanding of the epidermis, said Joan Gonzalez, **Infinitec**, who said that the most important function of the epidermis is to form a physical and chemical barrier between the organism and the environment. The mechanism of skin renewal was described and the problems caused by impaired barrier function explained. Gonzalez then introduced The Skin Maker as a specific actively targeted delivery system of two encapsulated peptides to the keratinocytes to promote synthesis of keratins. Extensive test results were used to demonstrate the mechanism of cell renewal and improved barrier function in response to The Skin Maker.

Ensuring actives reach their target has always challenged formulators. A presentation on behalf of **Naturethic** introduced eCapsules as a new delivery system for oil-soluble actives. Described as nanostructured lipid carriers they are claimed to combine all the advantages of liposomes and polymeric systems and to be biodegradable with improved penetration and stability. They also form a semi-occlusive film on the skin to add moisturising properties.

Natural remains the single most important adjective when describing cosmetic ingredients and there were many presented at Formulate with strong natural claims. Neossance Squalane and Neossance Hemisqualane from **Amyris** are vegetable squalanes obtained by fermentation of sugar. Neossance Squalane is an emollient that significantly increases cell turnover, improves its elasticity and reduces skin roughness. Neossance Hemisqualane is offered as a sustainable alternative to isohexadecane for cleansing products and wet wipes and is also used as a substitute for cyclomethicone and dimethicone in hair conditioning products.

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The cosmetic properties of *Limnanthes* (Meadowfoam) alba seed oil were presented by Veronika Solotoff, **Elementis**, who described its unique molecular structure not found in any other naturally occurring substance. It has a high content of long-chain fatty acids and offers extraordinary oxidative stability because of its natural antioxidant content and lack of conjugated double bonds. It is used to prepare derivatives such as Meadowderm [INCI: Meadowfoam delta-lactone], an ingredient that exhibits powerful anti-aging characteristics and actively contributes to the health and beauty of skin. Algaktiv Zen from **Greenaltech** is claimed to shield the skin from the effects of inner stress and thus prevent lifestyle aging. This is caused by fatigue, exercise, air-conditioning, central heating, alcohol, smoking, lack of sleep, diet and, most of all, by stress, said Joan Tarraga. This triggers the release of cortisol, which interrupts sleep patterns and causes fatigue, so there is a vicious circle. Algaktiv Zen is a microalgae blend that restores the homeostasis of the skin by protecting it from inner stress signals and restoring its natural circadian rhythm.

Anna Crovetto, **Active Concepts**, described the next generation of sulphur-containing anti-ageing actives represented by CytoSulf PF [INCI: Plankton extract, Leuconostoc/radish root ferment filtrate]. Based on the theory that cell life could be extended by sulphur-rich enzymes Active Concepts cultured the plankton *Chlorobium tepidum* that can transform sulphur available in the environment into a form that can be absorbed by other living organisms. This allows for creation and extraction of specific sulphide donors that, when topically applied, can slow the cellular ageing process. It does not induce cell death or overstimulate cell production but suspends cells in a semi-permanent, drawn out stage of rest.

There were various plant-based actives introduced at Formulate 2016, for example, Neurovity from **Laboratoires Expanscience** is an eco-designed ingredient, obtained from *Vitex negundo*, that prevents neuro-aging, increases cell longevity, reduces dark spots and homogenises skin complexion. MeiYanol [INCI: Sambucus nigra flower extract] from **Exsymol**, is an extract of elderberry flowers for the treatment of dark circles and puffy eyes. It neutralises reactive oxygen species (ROS) that cause inflammation, decreases expression of VCAM-1 and ICAM-1 attachment proteins that contribute to eye bags and chelates iron so there is a reduction in red blood cell accumulation that cause dark circles.

According to **CLR Berlin** consumers are looking for skincare solutions that can combat rising environmental stressors and probiotic-derived ingredients to keep the skin healthy looking. Fermented natural extracts provide a nutritive source of amino acids and antioxidants to moisturise and protect skin. CLR claims the physical barrier properties of skin are a product of constant successful skin renewal. The skin needs to adapt to deal with these challenges and CLR has launched ProRenew Complex CLR to assist it

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in so doing. It is obtained from a lysate of *Lactococcus* to provide a natural desquamation by proteolytic enzymes, which degrade the extracellular structural proteins of corneodesmosomes. This induces skin renewal and accelerates skin barrier recovery.

Biotechnology is being increasingly used to provide new actives for skin care and Dario Zanichelli, **Phenbiox**, explained how his company used innovative biotechnologies to enhance bioavailability of plant based active ingredients. Molecular bioliquefaction technology utilises enzymes to recover 100% of a plants bioactive compounds in a completely bio-available and active form as water based liquid ingredients. W Tr-Active is an ingredient isolated from white truffles using molecular bioliquefaction and its anti-ageing properties were fully described. Enzymatic activation technology of vegetal oils allows to break up triglycerides into their constituent fatty acids and glycerides, creating a completely new phytocomplex having brand new properties. An example material from **Phenbiox** is OleoSoft-4 that was developed applying enzymatic activation technology to a mix of almond oil, olive oil, linseed oil and borage oil, chosen for their content of different classes of fatty acids. It has a silicone-like feel and promotes skin moisturising and elasticity and was also shown to improve hair elasticity.

Although skin care is a major part of any cosmetic conference haircare was not neglected at Formulate. Tony Gough, **Innospec**, described how coacervate formation by Iselux [INCI: Sodium lauroyl methyl isethionate] could be utilised to create surfactant systems for 2-in1 cleansing and conditioning products. A coacervate is formed by the anionic shampoo dissolving a cationic polymer like guar hydroxypropyltrimonium chloride or polyquaternium-10, but an insoluble gel phase/aggregate forms as the shampoo is diluted on the head. This is positively charged overall and is deposited on the hair and is retained after rinsing to give conditioning.

Tom Castle, **Revolymex**, presented a styling resin called RevCare NE 100S, [INCI: Sodium polyitaconate] that is obtained from fermented feedstock by a green process. Working with hair products means measuring combing forces, style retention under different levels of humidity, hair flexibility and frizz control. Results of these tests show that RevCare NE 100S gives a hold that provides natural feel styling with low flaking and tack, has excellent environmental resistance and is an outstanding anti-frizz agent. Another ingredient recommended for frizz control was Shineblend 9503 [INCI: Cyclopentasiloxane, dimethicone/vinyl dimethicone crosspolymer, dimethiconol, PEG-10 dimethicone] from **Innospec**. It also protects hair from thermal treatments and provides a high shine and test results showed that it reduced blow drying times when compared with commercially available products. Other materials from **Innospec** that protected hair during thermal styling are Gelaid CPDP [INCI: Cyclopentasiloxane, dimethicone, phenyl trimethicone] and Gelaid

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CPDP-CF [Dimethicone, phenyl trimethicone] and their efficacy was proven using a Diastron MTT Friction Kit.

There were many other presentations, which will be described more fully in future features appearing in SPC.

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