

28 – 30 OCTOBER 2020

SEPAWA® CONGRESS

AND EUROPEAN DETERGENTS CONFERENCE
ECC ESTREL CONGRESS CENTER BERLIN

The 67th SEPAWA® CONGRESS VIRTUAL, the 16th European Detergents Conference and the Forum Cosmeticum 2020 as virtual events from 28 – 30 October 2020

The saying goes: “After the congress is before the congress.” And after such a successful event in 2019, who would have had the slightest doubt about its success in 2020? Hardly anyone. With a considerable boost due to the growing popularity of the congress with about 3300 participants the board of SEPAWA® e.V. and the organizers together with the responsible persons in the Estrel Congress Center have been busy with the preparation of the congress 2020.

After evaluating the latest participant survey and taking into account the increasing demand for exhibition capacity, the promising concept for the Congress 2020 was drawn up. Things turned out differently – the corona pandemic forces us to rethink. A hygiene concept drawn up together with the Estrel Congress Center and confirmed by the Berlin Senate originally made the congress appear feasible in a modified format. A hybrid alternative was discussed, and finally the board of SEPAWA® e.V. together with the organizational team decided at the beginning of October to hold the SEPAWA® CONGRESS 2020 exclusively virtually. A concept with many innovations – “new territory” for all participants.

Conclusion: The 67th SEPAWA® CONGRESS took place virtually together with the 16th European Detergents Conference (EDC) and for the first time with the DGK’s Forum Cosmeticum.

It is hard to imagine that the SEPAWA® CONGRESS together with the EDC as the most important meeting point of the detergents/cleaning agents, cosmetics and perfume industry in Europe could take place virtually. So no congress with parallel live lectures in different rooms, no exhibition with more than 300 exhibiting companies and more than two thousand interested

visitors, no face to face discussions and no social togetherness on the fringe. And yet the virtual, web-based congress was the only option.

SEPAWA® Award Ceremonies

An annual highlight is the honoring of special achievements which have been achieved in conformity with our association’s goals. The chairman of SEPAWA® e.V., Dr. Hans Jürgen Scholz, presented the awards virtually. Rest assured, the sums of money tied to the SEPAWA® Young Researchers’ Awards are real and were sent to the prize winners.

In keeping with tradition, the prizes were awarded before the keynote address. This year of course in a virtual ceremony by the chairman of SEPAWA® e.V. Dr. Hans Jürgen Scholz (see boxes on pages 3 and 4).

Presentation of “Young Scientists’ Award of the GDCh” and “Award of the GDCh Division of Detergent Chemistry”

The GDCh Division of Detergent Chemistry awarded 3 young scientists for excellent scientific work with special relevance for the development

of washing and cleaning agents. The award ceremony was presented by *Prof. Dr. Birgit Glösen*, TH Köln, University of Applied Sciences, President of the GDCh Division.

The prize for the best Bachelor thesis was awarded to Ms *Janine Birnbach*, Hochschule Niederrhein. The topic of the thesis is: “**Effect of Additives on the Phase Behaviour of an EO/PO-block-copolymer**”. The investigations were carried out in close cooperation with Henkel AG&Co. KGaA. Ms. *Janine Birnbach* presented her results in a lecture within the EDC lecture block.

Certain EO/PO-triblock polymers can form cubic liquid crystalline phases. These phases consist of densely packed spherical micelles of the polymer which are arranged in a cubic lattice. Usually these are highly elastic and inherently stable gels. Due to their ability to oscillate in the audio frequency range they are sometimes called “ringing gels”. The presentation deals with the effect of various additives on the phase behavior of an EO/PO-triblock polymer, in particular on the existence range of the cubic phase. The effects were characterized and interpreted by means of rheology, zeta potential measurement, diffusion ordered spectroscopy (DOSY), SAXS and electron microscopy (SEM). The obtained results



were compared with literature and discussed regarding the sticky hard sphere model and the DLVO-theory. The influence of additives like different low molecular weight surfactants, solvents, electrolytes and saccharides were studied. It was found that some additives e.g. ionic surfactants decrease the existence range of the cubic phase, whereas others e.g. saccharides showed the reverse effect. The predominant mechanisms for these opposite effects might be different for various additives. However, certain regularities were identified probably due to three different and overlaying mechanisms. One mechanism is related to additives which can change the polymer-water interface, e.g. n-butanol. Other additives might change the hydration shell of the EO-PO-polymers, e.g. maltose. Furthermore, complexation processes could occur, e.g. in case of surfactants, which decrease the hydrophobicity of the PPO-part. This leads to the disintegration of the cubic phase because the formation of polymer micelles is suppressed.

The prize for the best master thesis was awarded to Ms. **Frieda Nagler**, Friedrich-Schiller University Jena, with the title **"Synthesis of Hydrogels Based on Polydehydroalanine"**. Ms. Nagler addressed the results in her presentation as follows:

SEPAWA® Innovation Award 2020

Innovation is crucial for growth and competitiveness on the world market and is the foundation of our economy. For the eighth time, this year's SEPAWA® Innovation Award in the fields of cosmetics and detergents was awarded to three prize winners. The prize is intended to give impulses for an active idea management in the member companies of SEPAWA® and to sensitise the public for the valued innovation.

A neutral, independent jury of 6 members of the scientific advisory board of SEPAWA® and the SEPAWA® e.V. board selected 3 prize winners from 17 submitted proposals. The prize consists of a certificate and a trophy showing the SEPAWA® wave in a stylised design.



Bernd Heinken received the first prize on behalf of **Symrise AG** for the work **"Crinipan® PMC green – Micro Activated next Generation Antidandruff"**.

The second prize went to Dr. Leonhard Hagen Urner from the **University of Oxford** for his work on **"Designer Detergents for Medical Research"**.

The third prize, which was accepted by Dr. Joachim Storsberg, went to the **Fraunhofer Institute for Applied Polymer Research (IAP)** for the innovative work on the subject of **"In-Vitro Method for Investigation and Proof of Performance of Potential Active Ingredients in Hair Growth"**.

SEPAWA® Young Researchers' Award

The annual **SEPAWA® Young Researchers' Award** fulfills one of the most important goals of SEPAWA® to promote the training of the next generation of specialists. The prize is awarded to students for outstanding Bachelor, Master and doctoral theses. The jury selected 6 prize winners from the submitted works.

In the category "Outstanding university graduate with bachelor's degree" **Nele Dallmann** received the 1st prize for her work on "**Multi-parametric Characterization of Synthetic and Biodegradable Styling Polymers in Combination with Different Plasticizers**".

Marek Busch received the 2nd prize for his work "**Formulation of Microplastic-free Light Protection Agents – Influence on Skin Feel, Stability and Film Formation**".

The 3rd prize was awarded to **Franziska Schlüter** for her work on "**'Green' All-purpose Cleaners: Development, Performance and Sustainability**".

In the category "Outstanding university graduates with a master's degree" three works were awarded. The awards went to:

Daniela Ivanov (1st prize) for her thesis on "**Establishment of a Measuring Method for the Determination of Radicals in Excised Pig Skin after UV Irradiation**".

Marc-Kevin Zinn (2nd prize) for his research on "**Microbial Odour Formation in Domestic Washing Machines – Technical and Sensory Analysis**".

Ghaith Kourbaj (3rd prize) for his work on "**Measurement of Dermal Water Content by Confocal RAMAN Spectroscopy to Investigate Intrinsic Aging and Photoaging of Human Skin In Vivo**".

No prize was awarded this year in the category "Outstanding doctoral thesis".

The prize for the best dissertation was awarded to **Dr. Leonhard H. Urner**, University of Oxford & Freie Universität Berlin. The thesis is entitled: "**Glycerol Detergents Facilitate the Investigation of Drug Targets**", results were presented in a lecture:

Membrane proteins are targets for more than 50% of current drugs. Understanding their structure and interactions with biomembranes is of great interest in drug discovery. Detergents traditionally enable the purification and analysis of membrane proteins. However, design guidelines which allow us to fine-tune their structure for individual applications are currently not available. To address this shortcoming, we here present a detergent family derived from a byproduct of the biofuel industry: glycerol. Using a modular-designed library of dendritic glycerol detergents, we can identify for the first time how changing the structure of detergents allows controlling membrane protein purification and protein-lipid interactions during purification. In addition to a range of bacterial membrane proteins, dendritic glycerol detergents enable the purification and analysis of a functional G-protein coupled receptor (GPCR). The GPCR family is currently intensively studied due to its substantial role in widespread diseases. Therefore, our results represent a significant advance for the investigation of pharmaceutical targets and outline how sustainable resources can offer great potential for improvements in human health.

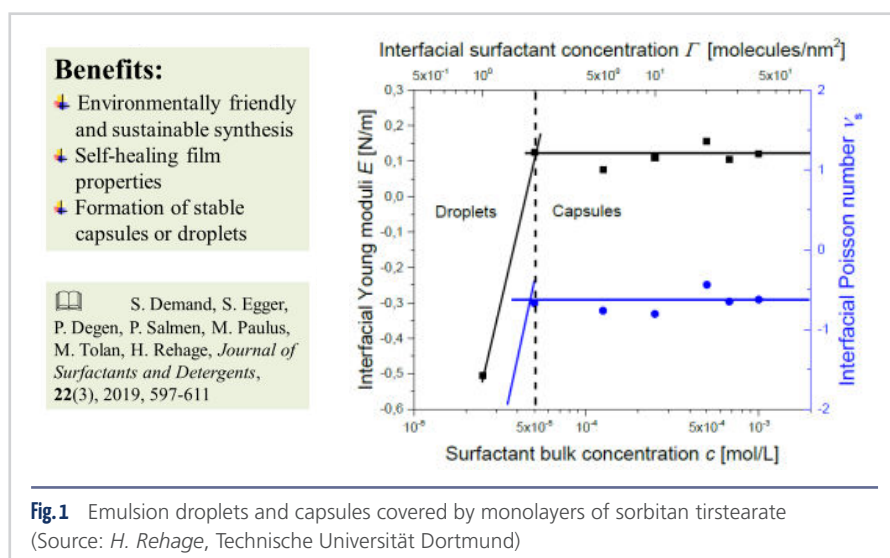
At this point it should be noted that the findings from the work were simultaneously awarded the 2nd Innovation Prize of SEPAWA® e.V.

The prize of the "GDCh Division of Detergent Chemistry" was awarded to **Prof. Dr. Heinz Rehage**, TU Dortmund University, for his many years of successful work in researching and answering colloidal-chemical questions. The title of his lecture was: "**From Coagulated Surfactant Films to Microcapsules, Filled Vesicles and Self-propelling Colloidal Particles**".

An excerpt from the presentation by **Prof. Rehage**: "The planned lecture gives a brief insight into current research

Hydrogels are widely spread in everyday applications such as in superabsorbents, cosmetic products or wound dressings. Further, they are discussed as promising solutions for water treatment, drug delivery or controlled fertilizer release. Polydehydroalanine (PDha) is a zwitterionic polymer of high charge density promising high swelling ratios, or response to pH and salt when applied in hydrogels. In the context of this master thesis, a library of PDha-based hydrogels was synthesized applying bis-epoxide functionalized modifiers. The crosslinking agents included poly(ethylene glycol)diglycidylether (PEGDGE) of four different chain lengths. The influence of the molecular weight of the PDha as well as of the modifier on the swelling ratio was studied. The highest swelling ratio reached was 18,000%. In addition, poly(propylene glycol)diglycidylether (PPGDGE) as a similar, but more hydrophobic modifier was tested. The corresponding hydrogels also exhib-

ited swelling in polar organic solvents such as MeOH and DMSO. Even more, the swelling ratio of selected hydrogels was shown to depend on pH and salinity, where the highest swelling ratios were determined in slightly basic environment. In KCl solutions, an "antipolyelectrolyte" effect was observed. Hence, at low salt concentrations the cation shields intramolecular interactions and thus causes higher swelling ratios than in deionized water, which is an important property for superabsorbents. As another application, the adsorption of dyes by PDha-based hydrogels was studied. Methylene blue as a cationic dye was adsorbed in basic environment and desorbed by addition of acid. Vice versa, adsorption of an anionic perylene dye was observed in acidic environment and desorption at high pH. Due to these observations, hydrogels based on PDha are interesting candidates for catalysis, delivery purposes or water purification.



topics of our institute. We start by discussing the structure and dynamics of surfactant films and show that some detergents, such as sorbitan tristearate (Span® 65) form highly viscous and elastic layers at fluid interfaces. We observed similar properties in other composite systems in which cationic surfactants were combined with multivalent counterions or with water soluble alginates. We used the stabilized surfactant films to produce nano- and microcapsules, which we investigated in detail. The advantages of these particles lie in the simple and environmentally friendly synthesis, and they show interesting self-healing properties. In pharmacy and medicine, vesicles or liposomes are often used for processes of drug transport. In order to produce such filled aggregates in a defined manner, we developed a new phase-transfer method in which tiny water droplets, suspended in oil, were transported across a thin surfactant film into an underlying water phase. With this method, we could continuously produce larger quantities of filled vesicles. In contrast to natural vesicles, our aggregates still contained small traces of oil in their membranes. This leads to interesting properties which are known from water-in-water emulsions. The worldwide trend of miniaturization has gained great interest in the development of artificial nano- and microsystems which can carry out independent swimming movements (nanobots). Lenticular alginate capsules represent a simple model system for

detailed investigations of new types of artificial locomotion. Polyethylene glycol or other spreading agents, that were stored in the core of the capsules, could escape through small membrane pores. Due to this simple spreading mechanism, the capsules showed rapid, circular movements near the water surface. After adding surfactants, we observed more complicated collective swimming processes due to Marangoni convection, and the microswimmers then formed pulsating rings or oscillating chains" (Fig. 1).

The Virtual Lecture Event – A Compilation of Selected Focus Topics

Among other aspects, the lecture event reflects the scientific foundation of our detergent, cosmetics and perfume industry in an excellent way. Thus, 9 scientific lectures on the topic area of "Green Chemistry along the Value Chain" were held within the framework of the **European Detergents Conference**, which is conceived by the specialist group 'Chemistry of Washing' of the Gesellschaft Deutscher Chemiker. In four lectures, the award winners of the GDCh Division had the opportunity to present their award-winning work. During the SEPAWA® Scientific Conference, which thematically deals with the latest research results of our industries detergents/cleaners, cosmet-

ics and perfumes including their regulatory framework, 21 lectures were presented. The lecture blocks in the Forum for Innovation are firmly established in the congress programme. This year, 65 speakers took the opportunity to present the latest in their developments. The lecture programme was complemented by a total of 14 poster presentations, submitted by young scientists from universities and academic institutes, as well as by employees from industrial research and institutional facilities in our sectors.

The 16th European Detergents Conference focused on novel substances, methods and processes that enable sustainable solutions for the future of detergents and cleaning agents. The research results presented lead to a deeper understanding of the underlying mechanisms with all aspects along the value chain. Among other things, we look at raw materials from biomass, address the challenge of sustainable product formulations and discuss the reduction of textile-based microplastics during washing.



A Selection from the Lecture Block of the 16th European Detergents Conference

Novel Surfactant Based on Non-food Biomass: Value Chain Design Starting from 5-Hydroxymethylfurfural

Prof. Dr. Regina Palkovits
RWTH Aachen University

5-Hydroxymethylfurfural (HMF) presents a promising platform molecule available based on the carbohydrate fraction of lignocellulosic biomass avoiding a competition to food production. Oxidation of HMF allows accessing furan-2,5-dicarboxylic acid

which has been proposed as substitute of terephthalic acid in PET production. Via reduction of HMF, a versatile set of biomass-based diols becomes available suitable for the design of tailored value chains to customized products. In this contribution, the potential of HMF to access tailored surfactants providing high-performance will be discussed (Fig. 2).

The work evolved in the frame of HICAST, the Henkel Innovation Campus for Advanced Sustainable Technologies, a research cooperation between Henkel AG & Co. KGaA and RWTH University.

Ionically Assembled Polyelectrolyte/Microemulsion Complexes (PEMECs) – Phase Behaviour, Thermodynamics and Structure

Prof. Dr. Michael Gradzielski
Technische Universität Berlin

The mixing of oppositely charged polyelectrolytes and oil-in-water (O/W) microemulsion droplets leads to the formation of polyelectrolyte/microemulsion complexes (PEMECs). Such systems were investigated by us for differently sized microemulsion droplets and for different types of polyelectrolytes ranging from flexible synthetic ones like polyacrylate (PAA) to rather stiff biopolymers like hyaluronate (HA) or carboxymethylcellulose (CMC). In the range of charge compensation, typically phase separation is observed while monophasic regions are present of excess of microemulsion or polyelectrolyte charge. The observed phase behaviour depends markedly on type and Mw of the polyelectrolyte employed, as well as on the charge density of the microemulsion droplets. In the case of using the mesoionic tetradecyldimethylamine oxide (TDMAO) as main surfactant the latter can be controlled by pH, which leads to systems strongly changing in the pH range from 5–8. The PEMEC structures were determined by a combination of static/dynamic light scattering (SLS, DLS), fluorescence correlation spectroscopy (FCS) and small-angle neutron scattering (SANS). They show that here elongated aggregates are

formed in the polyelectrolyte-rich part of the phase diagram, where the size increases upon approaching the phase boundary of charge neutrality, and it correlates strongly with the stiffness of the polyelectrolyte employed (Fig. 3).

Biosurfactants Made by Fermentation – Green, Mild and Powerful

Dr. Joachim Venzmer
Evonik Operations GmbH

Two biosurfactants, which have been known for decades, have recently been made available on commercial scale: sophorolipids and rhamnolipids. These microbial surfactants which occur in na-

ture as natural metabolites of various yeasts and bacteria, are now industrially produced by fermentation. Numerous publications and test data already prove their excellent ecotox profile and mildness to skin. In this presentation we will demonstrate that they are not only “green” and mild, but also exhibit unique properties resulting in high performance for a broad range of applications. Their physico-chemical properties, both in bulk and at interfaces, will be discussed and related to their special “double-hydrophilic” molecular architecture and pH-dependent behavior. The results demonstrate a broad utility for solubilization, formulation of microemulsions, foaming performance, and pigment dispersion. These benefits will be explained

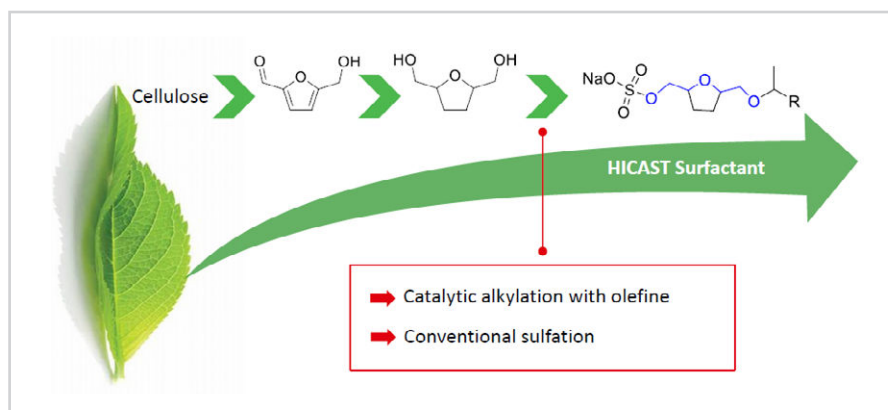
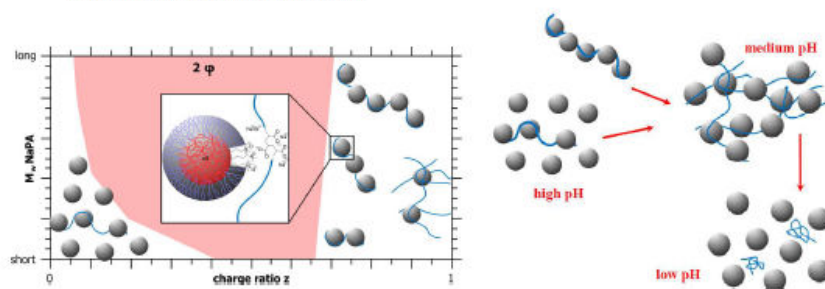


Fig. 2 HICAST Surfactant based on non-food biomass (Source: R. Palkovits, RWTH Aachen University)

- ❖ microemulsion droplets and polyelectrolytes form soluble complexes (PEMECs) at polyelectrolyte excess
- ❖ structure is controlled by mixing ratio, M_w of polyelectrolyte, salt, and droplet size
- ❖ tendency for elongated complexes - correlates with the stiffness of polyelectrolyte
- ❖ pH is a good control parameter



Source: "Structural Control of Polyelectrolyte/Microemulsion Droplet Complexes (PEMECs) with Different Polyacrylates", Miriam Simon, et al., Chem. Sci. 10, 385-397 (2019), DOI: 10.1039/C8SC04013C; Miriam Simon, "Formation and Characterization of Complexes of Oppositely Charged Oil-in-Water (O/W) Microemulsion Droplets and Polyelectrolytes", Dissertation, TU Berlin, 2020

Fig. 3 PEMECs – Conclusions (Source: M. Simon et al., Technische Universität Berlin)

based on ternary phase diagrams, and their interfacial behavior. In addition, a rationale for their stability against hard water will be presented (Fig. 4).

From the Presentation Block Scientific Conference – Home Care

No Plastic is not a Solution Either – Scenarios for a Sustainable De-fossilized Plastic Circular-economy

Prof. Dr. Thomas Müller-Kirschbaum
Henkel AG & Co. KGaA

No environmental issue is discussed as emotionally as plastic waste. Hereby, the focus is on plastic packaging. While developed countries mainly focus on optimizing collection and material re-

covery, developing and emerging economies lack adequate collection systems. At the same time, plastics have undisputed sustainable benefits. Plastics save enormous amounts of packaging material, they allow thin-walled packaging with low weight for efficient transportation, they are mechanically highly stable, chemically inert to aggressive ingredients and can be perfectly adapted to a variety of requirements. Current measures to prevent waste are the avoidance, reuse and recycling of packaging. An important pillar is the recycling of packaging. Manufacturers are asked to design packaging recyclable and to integrate as much recycled material as possible. At the same time, the waste management industry is asked to constantly further develop the collection, sorting and recycling infrastructure in

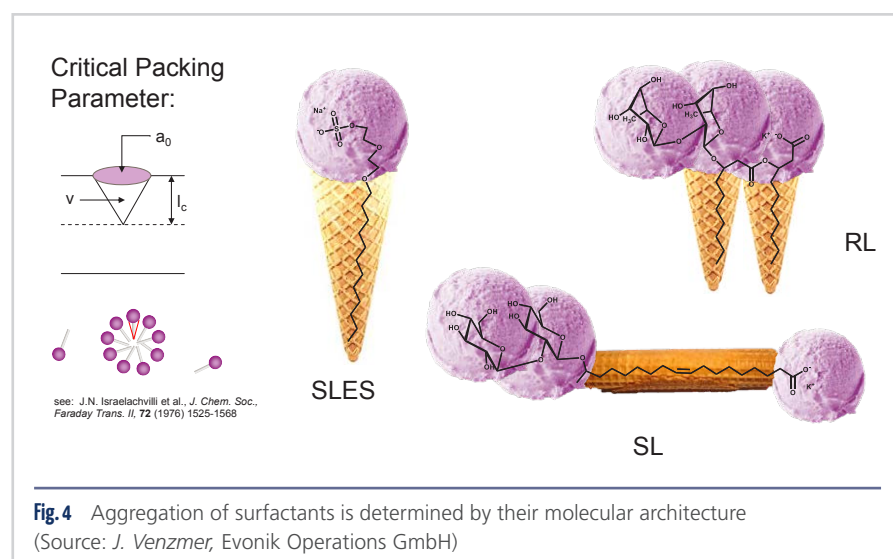
developed countries and even establish it in developing and emerging countries. A great potential is seen in the synergy of mechanical recycling with innovative processes such as chemical recycling. In these developments, not only the quantity, but also the provision of high-quality recycled materials must be the focus. The endpoint is a climate-neutral circular economy, in which the responsible use of plastic is fully integrated (Fig. 5).

SPECIAL: Effective Lobbying Today – the Association TEGEWA e.V. and the European Chemicals Policy

Dr. Alex Föllner

Association TEGEWA e.V.

The association TEGEWA e.V. coordinates and moderates the interests of some 100 member companies in the field of performance and process chemicals. Among their members approximately 40 companies produce surfactants and/or cosmetic ingredients for the cosmetic and the detergent industry. Since the 90ies the German Sector association TEGEWA is involved in European Law making processes, which have gained importance over the last 25 years. Today we can postulate that the major number of regulations which need be implemented by the German chemical manufacturers have been prepared and decided in Brussels resp. Strasbourg, whereas the first stimuli often have been triggered by single EU member states. How will a German-based association representing predominantly German companies be able to raise its voice in a European concert? In order to do so, several options are available, depending on the nature of course – it is thus key to choose the proper option. Nevertheless, which way ever to be chosen, they all have one basic principle in common: there is a need for allies to evolute impact, be it mutual advocacy in the format of strategic alliances or be it in a matching and work-sharing coordination with other organisations. On the basis of three upcoming regulations of relevance for the



A Climate Saving Non Fossil-Based Circular Plastic Economy is Possible...

... in case the following preconditions are realized during this decade:

- (1) Harmonized **EPR-schemes** (instead of plastic fees/taxes) with sufficient **incentives** for recyclability and recycled/biobased plastic & a **CO₂-fee** on all fossil-based carbon → **regulators**
- (2) Use „**circular plastic**“ instead of „recycled plastic“ (move to non fossil-based plastic, includes biobased plastic): One unified, global „Circular Plastic Label“ → **all stakeholders**
- (3) Fast and large **investments in mechanical AND chemical recycling AND biobased plastic** to ensure better **qualities, sufficient capacities and low CO₂-footprints** for circular plastic → **recyclers & chemical industry**
- (4) Support needed via **EU Green Deal & Recovery plan** (more research and subsidies) → **EU commission & governments**
- (5) Only **short-term oncosts for circular plastic** not higher than 120 % (mechanical recycled) to 150% (chemical recycled/biobased) vs. fossil virgin, **mid-term same cost level as fossil virgin** material → **chemical industry**
- (6) Commitment to **increase „circular plastic“** content in packaging → **manufacturers**
- (7) Readiness to bear **higher cost for packaging** → **entire value chain including retail and consumer**

Fig. 5 The Take Away (Source: T. Müller-Kirschbaum, Henkel AG & Co. KGaA)

TEGEWA member companies it will be demonstrated how European legislation in preparation can be monitored effectively by a German (or other National) sector association: 1,4-dioxane: The expected regulation will affect to a large extent the cosmetic and the detergent industry and their surfactant suppliers Polymers and REACH: Most likely REACH will be amended in order to consider a certain range of polymers for registration, which will affect huge parts of the chemical industry „Green Deal“: This topic will be a great challenge for the whole European Economy (Fig. 6).

Effective Cleaning through a Second Skin – Protein Layer Structure as Key for Successful Formulations

Dr. Matthias Reihmann
GELITA AG

The innovative *easy-to-clean* concept with hydrophilic protective layers, which are formed by functional collagen peptides on cleaned surfaces, enables the formulation environmentally friendly cleaning agents. Superior cleaning results, extended cleaning cycles, lower water consumption and simplified cleaning are documented. The surfactant-protein film interaction is key for successful formulations. The surfactant influences the hydrophilicity of the protective layer. Depending on the collagen peptide concentra-

- Industry needs to join forces for effective lobbying
- Industry needs to prepare for future debates „beyond facts“
- Industry needs to put more effort into a climate of confidence...
- ...without expecting fair play from other bodies
- Industry lobbying is more than ever „pushing the envelope“

Fig. 6 Take home messages (Source: A. Föller, Verband TEGEWA e.V.)

tion, cleaners have different surface affinities despite comparable surface tension. This drives the effectiveness of the cleaners. Further studies examined whether the protein film may promote growth of microorganisms or inhibit it. The first results show that the protein film has no practical disadvantages. In addition, transport and fixation of active substances to cleaned surfaces is possible to temporarily protect against pathogens (Fig. 7).

With or without Handshakes: Formulating Safe, Gentle and Effective Hand Disinfectants

Esther Lansdaal
Corbion

The coronavirus pandemic has brought renewed attention to the importance of hand hygiene. Health and governmental authorities worldwide stress the potential of conscientious hygienic practices, like those recommended by the

World Health Organization, to slow the spread of COVID-19. Thorough handwashing is an essential practice, as are “social distancing” habits such as forgoing handshakes, kisses and other forms of greeting that involve physical contact. Disinfectant products providing a convenient means of sanitization when handwashing is not possible are also important. But given the need for frequent hand cleansing to avoid infection, many disinfecting hand rubs are too harsh and drying to the skin. There is a need in the market for solutions that deliver both antimicrobial efficacy and gentleness. Many disinfectant hand rubs and sprays use high levels (>70%) of alcohol in order to deliver disinfectant properties and rapid evaporation. These high levels of ethanol dry out the skin with frequent use. Ethanol content of 40% is generally suffi-

- The protein layers could be used to improve the effectiveness of cleaners and disinfection agents.
- An Advance Queensland industry research fellowship awarded to Dr Heather Shewan funded by the Queensland State Government will study the effectiveness of NOVOTEC® CB800 based cleaners as disinfection agents. The work is based at the University of Queensland in cooperation with Oz Kleen and GELITA.
- The protein layers could be used to bind active substances to surfaces, e.g. to realize self-disinfecting materials. First experiments with photosensitizers are already running in the lab.

Fig. 7 Outlook 2021 and beyond – Where will it take us from here?
(Source: M. Reihmann, GELITA AG)

Antimicrobial formulation guidelines

- Levels of 1 – 3% of lactic acid are sufficient and depending on:
 - pH
 - surfactant system and concentration
 - viscosity of the formulation
- Chelating agents and alcohol can boost the antimicrobial performance.

Fig. 8 Antimicrobial formulation guidelines (Source: E. Lansdaal, Corbion)

cient to achieve quick evaporation, but too low to provide proper disinfection of the hands. However, when combined with lactic acid, 40% ethanol will eliminate germs, evaporate quickly and have a milder effect on the skin. Only eight different BPR type 1 products are registered today. Of those eight, only a few are safe, natural biocidal ingredients available for producing disinfectant hand soaps and gels, and even fewer are both effective and mild to the skin. Lactic acid is a natural, safe and effective PT1 registered biocide that enables the creation of lower-pH hand soaps and gels (pH 3 – 4.5) offering safety, mildness and antimicrobial efficacy without the use of aggressive biocides. This presentation looks at options for formulating products that help consumers protect their health without harshness to their skin (Fig. 8).

From the Presentation Block Forum for Innovation – Home Care

Innovation, Sustainability and Cost Trends in Detergent Formulations

Dr. Roel Hermant

Frames Formulation Intelligence B.V.

FRAMES is a Formulation Intelligence Platform that provides direct access to on-shelf detergent formulations and costs. A key functionality is the platform's ability to integrate all available public information and assign levels & costs, based on long-term expertise in product development and supply chain. FRAMES' smart-design database is uniquely positioned for competitor market research, to support innovations and optimize product cost-performance. FRAMES presents market trends for Home Care formulations in Europe and North America. Fast moving formulation developments are discussed in terms of innovative aspects and sustainability concepts. Focus will be given on surfactants, chelates, enzymes and polymers. The importance of detergent cost-performance optimization is highlighted by an ever-increasing margin pressure in Home Care and publicly available performance results of on-

shelf products, which are compared on a cost-per-wash based on retail price. Several examples are given from branded & retail detergents that use different formulation and manufacturing tactics. The latter (manufacturing capacity, material sourcing-handling-processing, quality) appears to become more specific for format or for handling of e.g. green materials. This can lead to a more complex supply-chain or raw material sourcing (Fig. 9).

From the Presentation Block Forum for Innovation – Personal Care

Sustainable Actives Made of Microalgae – Protection and Repair Following the Archetype of Nature

Dr. Sandra Christian

GloryActives GmbH

Microalgae have existed on our planet for nearly 4 billion years and were the precondition for organic life. In or-

der to survive under the extreme conditions on our planet at the beginning they have developed strategies to defend their cells against the harmful impacts of UV radiation and other environmental burden. In this lecture we would like to show how to use these strategies of the microalgae for the development of cosmetic actives. These actives adopt the mechanisms of microalgae to protect and repair our skin cells. Microalgae are the valuable feedstock for our actives, which are being produced with sustainable production techniques (Fig. 10).

Baycusan® eco E 1001: the New Naturally-derived film Former for More Sustainable Makeup

Astrid Wulfinghoff

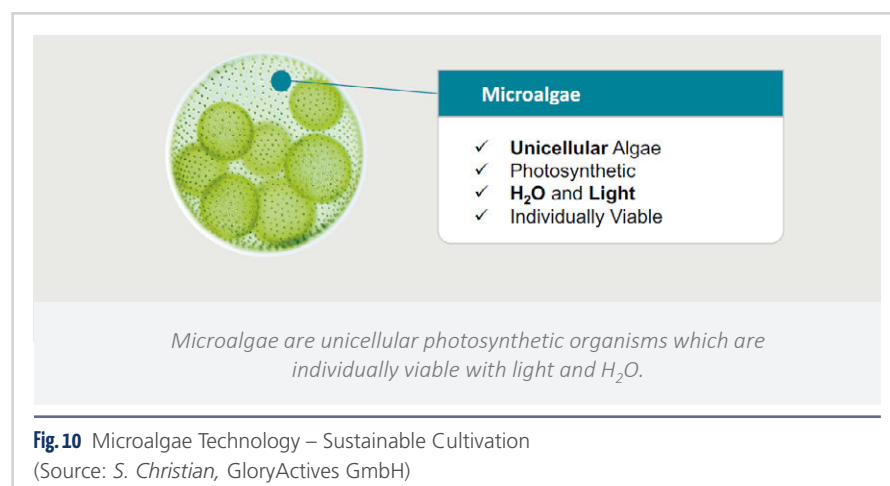
Covestro Deutschland AG

Today's consumers expect not only high-performance and new sensorial experiences from cosmetic products, they also desire to lower environmen-



- Sustainability is a main innovation in Detergents
 - Unilever to drop fossil fuels from cleaning products by 2030 (1 Sep 2020)
 - Henkel to introduce "Love Nature" GmbH (9 Sep 2020)
 - Ecover and other smaller brands pioneer "natural" since long
- Formulation changes
 - Laundry Liquids
 - ADW unit dose

Fig.9 Innovation – Sustainability (Source: R. Hermant, Frames Formulation Intelligence B.V.)



Microalgae

- ✓ Unicellular Algae
- ✓ Photosynthetic
- ✓ H₂O and Light
- ✓ Individually Viable

Microalgae are unicellular photosynthetic organisms which are individually viable with light and H₂O.

Fig.10 Microalgae Technology – Sustainable Cultivation
(Source: S. Christian, GloryActives GmbH)

tal impact with their daily personal care routine. Until now, formulators had faced the challenge of needing to choose between high-performance synthetic and natural components. Too often, the use of 100% natural raw materials in formulations was connected with visible and tangible disadvantages. In the color cosmetics segment, there are clear opportunities for more sustainable formulations. New product development is still not meeting the requirement of consumers on greener and high-performing makeup products. Film formers are crucial ingredients for makeup formulations as they impart must-have, long-lasting properties. So by using the next generation of bio-based film formers, formulators can increase natural content of traditional high-performing makeup formulations and also improve the properties of natural makeup products. Covestro presents its second partially bio-based film former, Baycusan® eco E 1001, specially designed to tackle this color cosmetics challenge. The product consists of more than 50 percent renewable carbon and may be labeled as a naturally-derived ingredient in accordance with ISO Standard 16128. Baycusan® eco E 1001 achieves at least the same desired performance level as synthetic film formers – especially in formulations where long lasting and transfer resistance are important. Baycusan® eco E 1001 imparts water-proofness, water-, sweat-, rub-off and transfer resistance to color cosmetic formulas, such as foundation and mascara. The new film former is an excellent way of enhancing the naturalness of makeup formula without compromising on performance (Fig. 11).

DEOBIOME NONI^{PRCF} – Natural & Microbiome Friendly Deodorant

Daniel Robustillo
Vytrus Biotech

The active ingredient DEOBIOME NONI^{PRCF} is an innovative biological deodorant that safely and permanently prevents the development of body

odour. Conventional deodorant active ingredients usually pursue two strategies, by clogging sweat glands or by bactericidal action. DEOBIOME NONI^{PRCF} is different and follows the concept of a biological deodorant. It allows the skin to continue its natural function and has been proven to be very well tolerated by microorganisms of the microbiome. The concept of the biological deodorant is based on two strategies. One is a biological strategy: plant quorum quenching molecules (QQ) prevent bacterial communication (as quorum sensing by signal molecules) and the formation of undesirable biofilms and are involved in the production of bad odours. On the other hand, a prebiotic strategy: DEOBIOME NONI^{PRCF} represents an innovative prebiotic cocktail based on sugars that modifies the metabolism of commensal skin microbiota from lipids to polysaccharides and reduces the production of bad smelling molecules. Nu-

merous tests prove the effectiveness of DEOBIOME NONI^{PRCF}, we can prove the mechanism of action and the effectiveness on the user. We show the quorum quenching (QQ) activity and the reduction of the quorumone synthesis (LUX-S/LUX-R). This causes the proven broad-band bacteriostatic effect (Gram+, Gram- & Fungi) and the prevention of biofilm formation. The active ingredient has also proven its microbiome compatibility and protects commensal bacteria from pathogenic germs. *In vivo* we determined the odour intensity by sniff test and by analysis with gas chromatography combined with mass spectroscopy (GC-MS). We tested in the armpit and on the foot, and we also determined the sweat rate in the armpit. We were thus able to prove that we have a highly effective and very well tolerated deodorant that meets the requirements of the modern market (aluminium-free, vegan, natural cosmetics, no preservatives) (Fig. 12).

Fig.11 Key Benefits of Baycusan® eco E 1001 (Source: A. Wulfinghoff, Covestro Deutschland AG)

<p>Declarations</p> <p>Free from: GMO, BSE, gluten, palm oil, cosmetic allergens, CMR ingredients, nanomaterials, VOC</p> <p>COSMOS certified</p> <p>ISO 16128 Natural Origin Index: 99.5%</p>	<p>INCI</p> <p>Glycerin, Morinda Citrifolia Callus Culture Lysate, Water (Aqua), Citric Acid, Maltodextrin</p> <p>Preservative-free</p> <p>China-listed INCI also available</p>
<p>Dosage</p> <p>Suggested use level: 0.5 - 2%</p>	<p>Formulation</p> <p>Water and ethanol dispersible</p> <p>Incorporation during the cooling phase (<40°C)</p> <p>Temperatures of up to 60°C for a short time do not affect the stability</p>

Fig.12 Deobiome Noni^{PRCF} – The Biological Deodorant – Technical information (Source: D. Robustillo, Vytrus Biotech)

Can Emulsions and Alcohol-based Systems also be Thickened Naturally?

Laura Ratz

Nordmann, Rassmann GmbH

In most cosmetic products, consistency enhancers are indispensable. But is it possible to use natural ingredients? In this year's presentation, our team will show you a range of versatile and innovative raw materials that thicken and stabilize both emulsions and alcohol-based systems in a natural way. We'll introduce you to the newly launched Kelco-Care™ Diutan Gum, an innovative raw material which achieves a thickening effect in emulsions as well as in alcohol-based systems. Taking a natural hand sanitizer gel as an example, we'll demonstrate that Kelco-Care™ Diutan Gum can thicken alcoholic systems with 70% ethanol. Furthermore, we'll present a rich hand cream formulation in which Kelco-Care™ Diutan Gum proves that even emulsions can be thickened and stabilized effectively. Based on rice, corn or tapioca, natural NATIVACARE™ starches combine perfectly with Kelco-Care™ Diutan Gum to offer effective solutions for thickening emulsions. In addition to providing thickening properties, the starches also allow for the creation of different textures and sensory experiences. Additionally, the BENTONE HYDROCLAY™ range contains other natural options for building consistency. These products not only thicken the water phase and offer thixotropic properties but generate textures that are both pleasant and silky. Based on hectorite, BENTONE HYDROCLAY™ 2000 is one of the most efficient rheological additives and provides formulations with viscoelastic characteristics (Fig. 13).

Efficient Foam Testing

Dr. Martin Hoffmann

SITA Messtechnik GmbH

Foam or the foaming of liquids plays a decisive role in almost all applications of cleaning and care products containing surfactants. Particularly in the case of personal care products, user perception is defined to a large extent by the foam.

The relationships between the raw materials used, formulations, foam creation and the resulting foam are complex and represent a major challenge in the research and development of surfactant-containing products. Modern measurement technology therefore has the task of reflecting these relationships as efficiently as possible. On the one hand, this means that the measuring systems used can record the relevant properties of the foam with the necessary accuracy. On the other hand, application-oriented foam production with a high degree of reproducibility and a high degree of flexibility in varying the test conditions is essential. Subject of the presented investigations are two shampoo formulations on which with the help of

the SITA FoamTester the influence of the test conditions on the resulting foam is discussed. In order to find the optimal test parameters to differentiate the different samples, varying the temperature, concentration or foaming strategy is used to generate specific foams and compare them to each other.


Scientific Analysis of the Foaming Behaviour of Aerosol Based and Emulsion Pump Foams

Dr. Andrew Mellor


KRÜSS GmbH

Numerous cosmetic products are offered in packaging with integrated foam applicators. These are usually

	BENTONE Hydroclay™ 2000	BENTONE Hydroclay™ 1100	BENTONE Hydroclay™ 900
INCI	Hectorite	Magnesium Aluminum Silicate	Hectorite, Hydroxyethylcellulose
Use Level	0.3–3%	0.25–9%	0.1–3%
Properties	- High viscosity - Thixotropy and syneresis control - Blurring/soft focus effect	- High viscosity - Thixotropy for easy coverage - Blurring/soft focus effect	- Less shear thinning - Pseudoplastic flow
ISO 16128 Natural Index	1	1	1
pH Range	6-11	6-11	3-11
Viscosity	Good	Good	Excellent
Suspension	Excellent	Good	Excellent



ECCOERT
COSMOS
APPROVED



ECCOERT
COSMOS
APPROVED

Fig. 13 BENTONE Hydroclay™ (Source: L. Ratz, Nordmann, Rassmann GmbH)

Measurements were started after pumping 10 (B) or 20 (A) times into the column

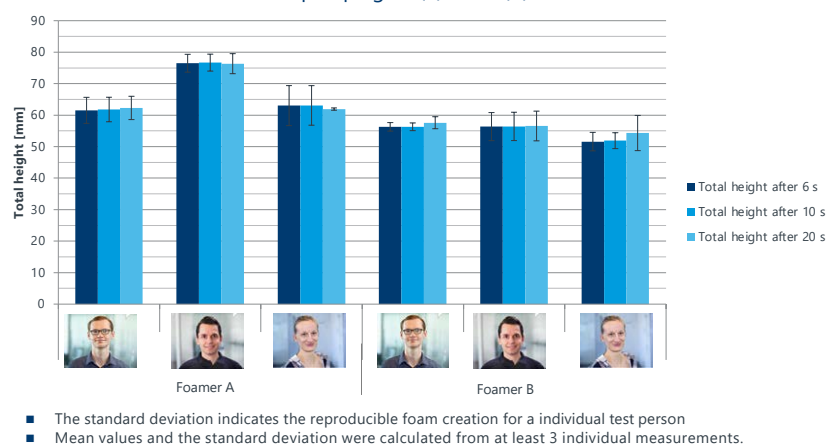
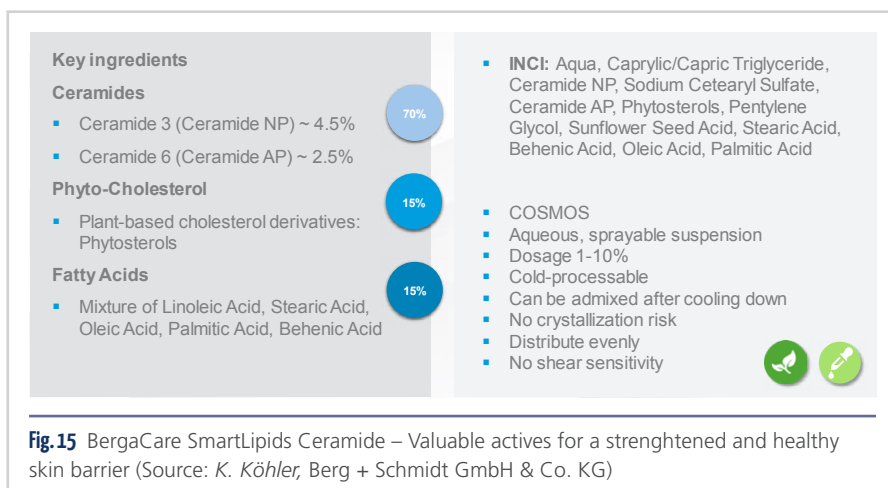


Fig. 14 The amount of created foam is more independent of the test for foamer B than it is for foamer A (Source: A. Mellor, KRÜSS GmbH)



ing blocks of the skin barrier. The skin's natural regeneration process to restore the lipid layer is often reduced with stressed or damaged skin, which makes the dermal application of ceramide containing products necessary to rebuild the lipid layer. Specially developed for those requirements, BergaCare SmartLipids Ceramide offer lipid encapsulated skin-identical submicron molecules mimicking, repairing and enhancing the natural skin barrier. The SmartLipid technology offers additional advantages such as higher ceramide loading capacity, improved skin penetration of the active, reduced TEWL, stabilized system and easy incorporation (Fig. 15).

'Clean and Green' Ingredients

Dr. Nora Schiemann
IMCD Deutschland GmbH & Co. KG

Clean Beauty is a trend that meanwhile has been becoming a lifestyle. Undeceived customers have more and more specific questions, which reveal that Clean Beauty is being understood in different ways. For this reason, there is now more talk about Clean and Green, which addresses both the benefit for the consumer and the environmental impact in sourcing and use of a product. The focus is on terms such as ethical sourcing, natural compatibility and health. This applies to all areas of daily life and ultimately also to cosmetics. Examples of ingredients that reflect this trend illustrate how the cosmetics industry takes these customer needs seriously (Fig. 16).

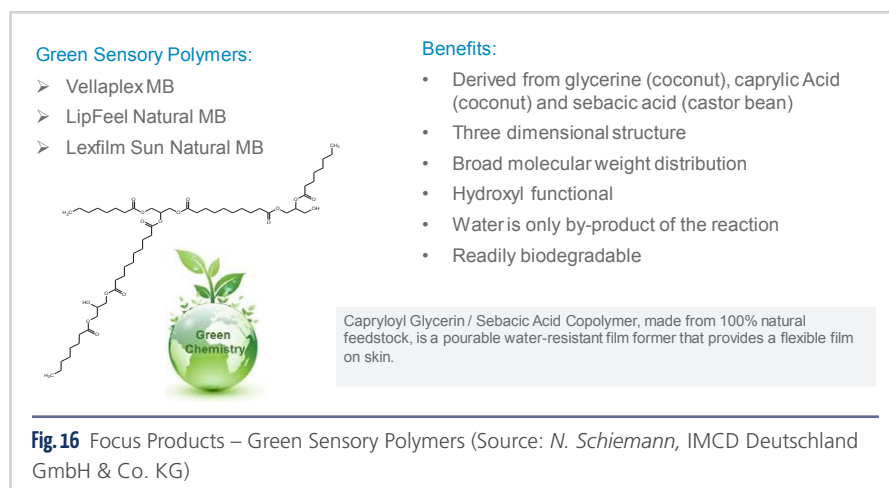
aerosol-based foams that are produced directly from a container under gas pressure. Products in which the foam is generated manually by a pumping process are in vogue, as they meet higher requirements for sustainability and product safety. The development of emulsions which are foamable by manual pumping processes is technically challenging. Alternative, low viscosity formulations are necessary to produce foams by such pumping processes at all, and it must also be ensured that the so generated foams have a familiar appearance for the consumer and, above all, that they are comparable in each individual application. Currently, however, there is often a lack of suitable technical analysis facilities for these foams, as commercial foam analysis devices use a device-specific foam generation which does not correspond to the actual foam generation in the consumer's end product. Here we present an application test with the corresponding measuring method to reliably determine the foam structure (i.e. bubble size distribution) and its aging. In this test the foams are produced in the same way as in the actual application of the end product by the consumer. By testing with several test persons we can quantify the reproducibility of the different foam generation processes for different formulations in numbers. In addition, statements can be made about the moisture content and drying of the foams. As typical model systems, we have developed pump foamable cosmetic emulsions with different surfactants and subject-

ed them to the application test. Here, a widely used surfactant, APG, and a polyglycerol ester were used as different tensides (Fig. 14).

Small, but Smart – Your Submicron Bodyguards: Boosting the Skin Barrier with Ceramide Delivery Systems

Kristin Köhler
Berg + Schmidt GmbH & Co. KG

The skin barrier protects our skin from dehydration, prevents from external aggressors and ensures the functionality of the skin as our body's biggest organ. It is a real bodyguard. However, internal and external factors can harm the sensitive lipid layer and affect the protective functions possibly resulting in a decreased humidity level, hypersensitivity or premature skin aging. Besides cholesterol and different essential fatty acids, ceramides are the most essential build-



From the Presentation Block Scientific Conference – Sustainability by LUV

EU-harmonised Poison Centre Notification (PCN); Obligations, and Deadlines; UFI-code, a New Label Feature

Dr. Gertraud Scholz

IPPM GmbH

The EU harmonized product notification is mandatory for new or modified consumer products and professional products with physical or harmful health hazard characteristics as of January 1st, 2021. For industrial products, a reduced notification obligation is required as of January 1st, 2024 plus 24h/7d call service. Cosmetic products are not affected for product notification, a PCN (Poison Center Notification) dossier with harmonized information is submitted under a unique recipe identifier – the UFI (Unique Formula Identifier) to the appointed body of the respective EEA state. The UFI is a 16-digit alphanumeric code consisting of numbers and letters, generated from VAT + individual recipe number and is part of the label or, for industrial products, to be mentioned on the SDS. The data file for registration in PCN format and UFI generator are available on the ECHA website. Each company that markets dangerous products in the EEA has an obligation, depending on its role as formulator, toll-formulator, importer, distributor, private label, re-branding and re-labeler. The distributor does not have to notify but must ensure that the product notification was done by the supplier in the relevant target countries. National product notifications are valid until December 31st, 2024 (Fig. 18).

From the Presentation Block Forum for Innovation – Sustainability

Solvay Sustainable Ethoxylated Surfactants

Florence Bussod

Solvay

As our market grows towards a more environmentally friendly future, today's consumers search for sustain-

Keynote Address

The Big Melt

Prof. Dr. Dirk Notz

Bitter cold, frozen oceans, gigantic glaciers: This prevailing image of the polar regions of our planet still captures the true look of these regions quite well. But possibly not for very much into the future: In the Arctic, sea ice on the Arctic Ocean disappears rapidly, temperatures rise two to three times as fast as the global average, and the glaciers slowly disappear.

We quote Prof. Dr. Dirk Notz: "In the presentation, I combine my own experiences from numerous expeditions into the polar regions with the scientific background of climate change. In



doing so, we will explore climate change in the distant past, the rapid changes that we all experience today, and will examine how the future will possibly look like. And in doing so, we will be able to answer the overarching question of whether we can still stop the big melt." (Fig. 17).

- The climate of our planet is warming
- The changing climate will cause a climate state that humans have never experienced
- a maximum of about **400 billion tons of CO₂** may still be emitted to probably keep global warming below 1.5 °C.
- about **40 billion tons of CO₂** humans currently emit every year.
- To stop global warming, we must reduce net-CO₂-emissions to zero.
- This holds for every country, every region, every sector, every person.
- How can we achieve this goal?

Fig.17 The Big Melt – Summary (Source: D. Notz)

- Access your portfolio – which products are affected
- Use (consumer, professional, industrial) and deadlines
- Target member states (EEA), language
- New Transparency of supply chain via UFI; strategic planning e.g. private label
- UFI-Management; link Product identifier- formulation code-VAT (e.g. mother company), UFIs of suppliers, UFI of MIMs
- Option of limited submission
- Option of group submission
- Define a responsible person and contact point
- Organisation of submissions and updates
- Mapping your companies data and keep the data up-to-date, e.g. composition change, supplier change

Fig.18 EU-Harmonised Poison Centres Notification – Be Prepared (Source: G. Scholz, IPPM GmbH)

able home care cleaning formulations with naturally derived, biodegradable ingredients that maintain excellent performance. Formulators rely on

innovative, nature-based ingredients to deliver safety and reliability to consumers. Sustainable cleaning routines go beyond naturally derived ingredi-

Scientific Conference: Session German Association of Perfumers



DEUTSCHE GESELLSCHAFT
DER PARFÜMEURE

in der
SEPAWA

Thursday morning was dedicated to a series of lectures with topics on scent and smelling.

The decision on the 2020 sponsorship award was already made at the beginning of the year. Out of all the very high quality applications, Ms **Celina Louise Sharp** emerged as the winner with her Master's thesis **"In Vivo Evaluation of Efficacy and Skin Compatibility of Hedione and Ambroxan Including Olfactory Assessment"**. This thesis, which was prepared at the University of Hamburg in cooperation with the company Frey&Lau, convinced the jury with its comprehensive scientific approach and the combination of objective efficacy measurements for a cosmetic preparation with the olfactory assessment by the test persons.

During the SEPAWA® CONGRESS VIRTUAL 2020 in October, Ms Sharp was formally honoured as the winner of the sponsorship award. In her presentation, she clarified that the investigated fragrances hedione, ambroxan and phenylethyl alcohol showed a positive

effect on the skin. For this reason, future research should also investigate the potential of fragrances as active ingredients. Regarding the subjective assessment of the test emulsions, all preparations with the fragrances were rated better than the placebo without fragrance.

This was the ideal follow-up to another lecture at the SEPAWA® Fragrance morning on 29.10.2020: Ms **Rita Ribau Domingues**, Olfasense, gave an excellent overview of today's instrumental possibilities in the evaluation of fragrances under the title **"What Smells Good Sells Better: Odour Testing in Personal and Home Care Products"**. The human nose still plays the decisive role. Special test equipment and a well-trained panel are required so that several testers can evaluate under exactly the same conditions.

The lecture by **Professor Dr Thomas Hummel**, Technical University Dresden, on **"Taste and Smell Dysfunction,**

and Consequences of Olfactory Loss" was also very informative. Prof. Hummel first introduced the physiology of smelling and showed that a loss of the sense of smell has far-reaching effects on a person's well-being. Due to a COVID-19 infection, many affected people temporarily lose the ability to smell, usually lasting 4–8 weeks. Fortunately, the olfactory brain is plastic: with regular olfactory training, the ability to smell returns more quickly!

Overall, the interest in the Fragrance lectures at the SEPAWA® CONGRESS VIRTUAL was high. Of course, we very much hope that we will be able to smell live again at the 2021 congress!

ents, however. Home care solutions that reduce overall water usage, prioritize renewable energy and limit the implementation of unnecessary plastic add value to sustainable cleaning routines. Solvay works through responsible sourcing to improve our environmental impact in our range of sustainable home care ingredients. In this framework, Solvay is innovating by finding a new way of manufacturing to reduce the carbon footprint of its ethoxylated surfactant by using ethylene oxide made from sugar cane instead of petrochemical feedstock. The Bio ethylene is produced by fermentation and oxidation of the sugar cane. For sustainable home care solutions, Solvay offers natural-based ethoxylated surfactants with 100% of natural origin carbon. Our Rhodasurf® 6 NAT

and Rhodapex® ESB-70 NAT are sustainable, high renewable carbon index surfactants that combine excellent performance with eco-friendly sourcing. For instance, Rhodasurf® 6 NAT is a 100% bio-based Laureth-6 from Palm Kernel and Sugar Cane. Its performance is identical to petro-based options but having 100% of natural origin carbon. Using Rhodasurf® 6NAT will allow formulators to reduce the green house gas emission by 20% and the consumption of Nonrenewable resource by 30% by replacing all petrochemical feedstock with biobased product. Rhodapex® 6 NAT is used in applications such as laundry detergents as excellent emulsifiers with good detergency and wetting properties but with an outstanding sustainable profile.

From the Presentation Block Forum for Innovation – Technology & Machinery

Dust Free and Safe Handling of Powders in Home and Personal Care Production

Dr.-Ing. Hans-Joachim Jacob
ystral gmbh

In production of Cosmetics, Detergents and Cleaners many powders have to be mixed into liquids. Their dust is always hazardous if inhaled and often additionally combustible causing the risk of a dust explosion. Breathing fine dust is often harmful. Enzyme powders like Amylase or Protease for example cause sensitisation. Aluminiumchlorhydrate, SLS-powder and organic acids are extremely irritant. Other powders may cause lung disease if inhaled. Later in final liquid, gel

or cream they are completely safe. But during production they are critical. Other powders create combustible dust during transport and handling. Examples are organic thickeners, polymers, encapsulated fragrances, organically coated powders, waxes, starches etc. Starch or vitamin B3 for example, which is applied in many skin care formulations, is often used to demonstrate dust explosions. Ystral provides a Technology for dust free and safe induction of harmful and dust-ex powders under controlled conditions. Ystral TDS machines create an internal vacuum inside the liquid. This way the liquid itself inducts the powder dust and loss free directly from bags, drums or boxes. No filters nor dust extractions are required. Even powders with very low Minimum Ignition Energy (MIE) are inducted without risk. Ystral provides machines for installation in classified ex-zones. But in Home and Personal Care Production the area for handling these critical dust-ex powders is typically not classified as dust-ex zone. This is no problem. Ystral provides specially equipped and certified machines for the safe handling of dust-ex powders even in not ex classified zones. These machines have a special ATEX classification. Another topic is the induction into inflammable liquids like alcohols. A typical example is the induction of resins into ethanol in the production of hair lacquer. Severe accidents happened in the past. The Conti-TDS guarantees a safe process today (Fig. 19).

SPECIAL: What has COVID-19 Changed in People's Everyday Life and Conclusions with Regard to a 2nd Wave

Prof. Dr. med. Axel Kramer
University Medicine Greifswald

The following topics were discussed in detail: Hypothesis about the origin of SARS-CoV-2 and its pandemic spread; transmission and persistence of SARS-CoV-2; effectiveness and indications of hand and surface disinfection; role of social distancing and personnel protective equipment (PPE), wearing length of protective masks and possibilities of reprocessing; criteria for private-sector quarantine; the principle of the triage before hospitalization of patients; prevention of respiratory infections including COVID-19 by antiseptic gargling; keeping a health diary for health self-monitoring; importance of contact person tracking in different living and working areas; role of children for transmission of SARS-CoV-2 and consequences for daycare centers, kindergartens and elementary schools; what has COVID-19 changed in people's everyday life such as new prevention awareness, fewer children suffering from colds, zoom meetings instead of business trips, restriction of international travel and reduced CO₂ emission; relocation of production of PPE and drugs back to Germany; awareness of local products; eliminating hygiene deficien-

cies in the accommodation of foreign guest workers, and conclusions with regard to a 2nd wave.



Forum Cosmeticum 2020

Using synergies even in difficult times. The active contribution of many members of the German Society for Scientific and Applied Cosmetics (DGK e.V.), the Society of Swiss Cosmetic Chemists (Swiss SCC) and the Society of Austrian Cosmetic Chemists (GöCH) has a long-standing tradition at the SEPAWA® CONGRESS. Now the Forum Cosmeticum 2020 has taken place under the umbrella of the SEPAWA® CONGRESS as a one-and-a-half-day lecture event. Scientific cosmetics will thus be given an even higher status at the congress.

EcoSun Pass: A Tool to Evaluate the Ecofriendliness of UV Filters Used in Sunscreen Products

Dr. Sascha Pawlowski
BASF SE

Cosmetic products are widely used around the globe and the demand for high quality and safe products is still rising. In recent time, the environmental impact of cosmetic ingredients gets increasingly into focus. UV light absorbing agents as part of sunscreen products are currently under scrutiny whether they might negatively impact the environment such as corals and coral reef community. Therefore, a scientific based tool entitled "EcoSun Pass" was developed which enables the evaluation of the ecofriendliness of UV filters used in sunscreen products. EcoSun Pass is the first tool which allows the combined assessments of both, environmental impact and efficiency of UV filters. As a first step, a hazard score of a UV-filter was identified using avail-

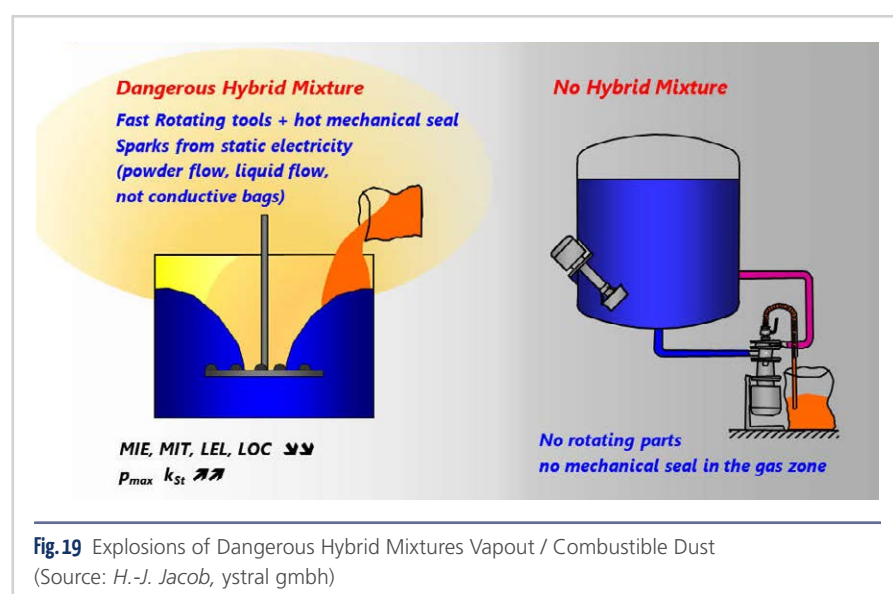



Fig.19 Explosions of Dangerous Hybrid Mixtures Vapour / Combustible Dust
(Source: H.-J. Jacob, ystral gmbh)

	SPF 50	SPF 50	SPF 50	SPF 50
	3,0% PBSA	3,0% PBSA	2,0% PBSA	2,0% EHT
	1,0% EHT	2,5% EHT	2,5% EHT	2,0% BEMT
	10,0% OCR	5,0% BMDBM	5,0% EHS	4,0% MBBT
	4,0% BMDBM	5,0% EHS	2,0% BEMT	6,0% DHHB
	5,0% EHS	2,0% BEMT	4,0% MBBT	3,0% TBPT
3,0% BEMT	4,0% MBBT	6,0% DHHB		
UV-Filters concentration	26%	23,5%	21,5%	17%
SPF calc.	52	49,1	50,1	51,4
UVA-PF calc.	17,0	16,8	27,3	33,4
The BASF EcoSun Pass	0	175	216	263

Improvement of environmental compatibility of UV-filter system is possible

Fig. 20 EcoSun Pass Calculation – Sun Care SPF 50 (Source: S. Pawlowski, BASF SE)

able physico-chemical, environmental fate and ecotoxicological data. At second, the hazard score of this substance was multiplied by its concentration in the product. For a certain composition of UV-filters, the sum of these results represents an ecotoxicological ranking value of the product, which is then related to the maximum achievable level. The resulting relative ranking value allows the optimization of the composition of sunscreen products with respect to most ecofriendly properties (Fig. 20).

Sun Protection – New SPF-Methods Make UV-Protection Visible, Wavelength by Wavelength

Uli Osterwalder

SunProtectionFacilitator GmbH

The imminent break-through of new sun protection factor (SPF) test methods will open up a whole range of new understanding and new opportunities to improve sun protection further, e.g. towards uniform protection, aka spectral homeostasis. The SPF as defined by Franz Greiter 60 years ago measured protection against the natural sun. The current gold standard ISO 24444 uses solar simulated UV radiation with a bias towards UVB radiation and the complete lack of visible light. We can fill in this blind spot by transmission measurement *in vitro* or calculation based on the absorption and scattering of the UV filters (*in silico*). Such alternative SPF methods have been under development for many decades, but none

of them can be used as a complete surrogate of ISO 24444 so far. The hybrid diffuse reflectance method (HDRS) comes closest because it is also based on an *in vivo* data, while not generating an erythema. Replacing an established method by an improved, simpler, faster or more accurate method happens in many areas, especially in health care. To give all relevant alternative methods a fair chance to be evaluated, a group of stakeholders such as sunscreen manufacturers, UV filter suppliers, testing institutes, equipment suppliers, academia and other experts formed the Consortium ALT-SPF. The German Society of Scientific and Applied Cosmetics (DGK e.V.) has been actively involved in the test design. The statistical concept has been developed by Quodata GmbH, which specializes in interlaboratory testing, validation of measurement methods, experimental and sampling

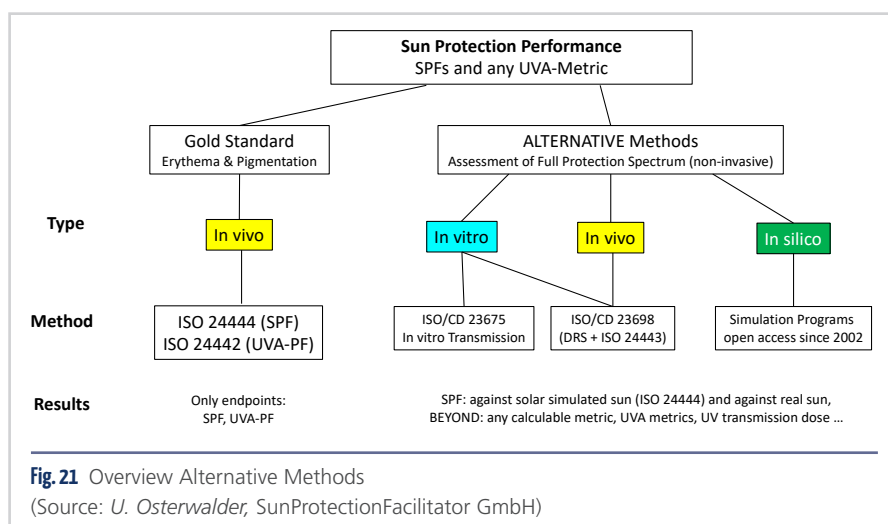
design. An alternative SPF method should fulfil the condition of commercial neutrality, i.e. the commercial bias (systematic bias for single products) is negligible in comparison to the reproducibility standard deviation according to ISO 5725. This paper presents the progress and first results of the Consortium ALT-SPF (Fig. 21).

“Seeing is Believing” – What About Feeling? A Sensory-Driven Formulation Concept

Petra Huber

ZHAW Zurich University of Applied Sciences

Also in “digital times” sensory benefits are known to materially affect consumers’ choice not only for cosmetics. Formulations of (natural) cosmetics may need to be optimized or modified if they are prone to initial sensorial issues or if the critical requirements of consumers are not adequately addressed (e.g. biopolymers instead of “liquid plastics”). Or a formulation should be optimized by addition of sensory modifiers, the selection of emollients or rheological additives, and structureproviding raw materials. However, there is a large range of potential additives and hence product developers are keen to receive rapid, preferably real-time, time-saving and reproducible feedback on new formulations. After several years of investigations this presentation will propose a roundup about how



a sensorydriven process of formulation development can be made easier “visible” and observable and how the transferability of a predictive model enables the identification of suitable ingredient candidates (Fig. 22).

Senolytics – Clearing Aging Skin of “Zombie Cells”

Dr. Franziska Wandrey
Mibelle AG

Cellular senescence is one of the hallmarks of aging and describes a state of cells that cease to divide. Senescence may occur as a consequence of DNA damage, for example induced by UV irradiation, or by reaching a maximum number of cell divisions for that particular cell type. These senescent cells are not fully alive, but they are far from dying: they secrete a plethora of factors, including pro-inflammatory molecules and are thus regarded as “zombie cells”. In the skin, senescent fibroblasts accumulate with age and cause chronic inflammation reactions which further contribute to the aging process. A novel concept called senolytics helps to clear tissues of senescent cells in order to reduce inflammation and rejuvenate the tissue. Notably, healthy cells are not affected by senolytic agents as they specifically target senescent cells. To apply the concept of senolytics for the first time in cosmetics, an *in vitro* study was performed using fibroblasts in which senescence was induced by oxidative stress. An extract of alpine rose leaves was able to significantly reduce the number of senescent cells in culture while not affecting the number of non-senescent cells. In a randomized,

- **Sensory panel testing** remains the **gold standard for an all-over and broad objective characterization**.
 - **Predictive models using instrumental measuring methods** which are broadly applicable in predicting sensory product characteristics have yet to be developed (**no general model**).
 - However, the instrumental techniques described in these **studies can represent cost-effective techniques** for use in **product pre-screening tests for specific product categories and under certain conditions** (provided appropriate sensory profiling has been validated) for e.g. prescreening potential sensory additives or (bio-)polymers.
 - **Frictonometric measurements** have a satisfactory correlations especially for the “**Afterfeel**” phase of emulsions (needs different amounts of emollients) (Study 1 and 2).
 - Characterization by **oscillometric values** correlated best with the sensory **evaluation of the gels** (Study 3).
- As **sensory data are recognized as a key to success in the market**, they provide the link between formulation, marketing and consumer expectation
- There is **no acceptable substitute for the human fingertip!**
Seeing and touching is believing!

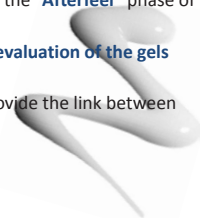


Fig. 22 Outcomes & Conclusions (Source: P. Huber, ZHAW Zürcher Hochschule)

double-blind placebo-controlled clinical study, the active ingredient significantly reduced redness and improved skin elasticity (Fig. 23).

Thanks, Conclusion and Outlook

The board of SEPAWA® e.V. would like to thank all those who contributed to the success of the 1st SEPAWA® CONGRESS VIRTUAL. In particular, these are the 116 lecturers who faced the extra effort of video recording and the 117 exhibitors who filled the virtual exhibition with professional content and also the 14 poster presenters. They are also the 935 congress participants (2270 accumulated congress participants during the 3 days) who actively participated in the chat or passively as spectators in the virtual auditorium. It is interesting to note that we recorded an increase of approx. 35% in the number of listeners at the lectures compared to the previous year. Of course, the number of virtual exhibitors has fallen by about two thirds. The international character

of the event with participants from 42 countries remains. The virtual journey knows no obstacles.

As a conclusion it remains that SEPAWA® e.V. has succeeded in successfully carrying out the 67th SEPAWA® CONGRESS VIRTUAL under the restrictions of the Corona Pandemic. However, an honest stock-taking after the congress also shows that SEPAWA® e.V. has suffered considerable financial losses. We all know that an association of our kind also lives from personal contacts and discussions. A return to ‘new normality’ is our goal. Then nothing will stand in the way of a SEPAWA® CONGRESS 2021. Special thanks go to the organising team of the congress at the office of SEPAWA® e.V. and the Verlag für Chemische Industrie. The preparation for the 68th SEPAWA® CONGRESS has already begun.

- Zombie cells = senescent cells
 - Senescent cells exacerbate the aging process
 - Senolytics selectively eliminate senescent cells
 - An Alpine Rose leaf extract showed senolytic efficacy
- Translation of a novel anti-aging topic for cosmetics

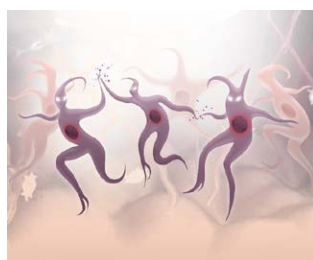


Fig. 23 Senolytics – Summary (Source: F. Wandrey, Mibelle AG)

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