

26–28 OCTOBER 2022

# SEPAWA<sup>®</sup> CONGRESS

ECC ESTREL CONGRESS CENTER BERLIN



# 2022

# Congress Report

The 69<sup>th</sup> SEPAWA<sup>®</sup> CONGRESS, the 18<sup>th</sup> European Detergents Conference  
and the Cosmetic Science Conference from 26 – 28 October 2022 in Berlin





# “Sunshine” on the Sonnenallee

By now, word will have got out:

“The SEPAWA® CONGRESS has again taken place at the Estrel Congress Center in Berlin.”

For two years, the traditional face-to-face congress had to be held virtually because of extensive pandemic restrictions. The organisers, the Executive Board of SEPAWA® e.V. and SEPAWA® eVent GmbH, were not sure in the run-up to the congress whether the well-known congress format would still be attractive?

During parallel sessions, the results of industry-related basic scientific research were presented as part of the European Detergents Conference (EDC), the results of scientific cosmetics as part of the Cosmetic Science Conference (CSC) of DGK e.V., and the results from application-orientated R&D on detergents and cleaning agents, cosmetics and perfumes. The latter also reflected the work of SEPAWA® specialist groups.

The block of lectures on regulatory issues and sustainability, which was conceived by the SEPAWA® Specialist Group “Legislative – Environment – Consumers” and the Main Committee On Detergents (HAD) of the GDCh, was a feature of increasing importance. The TEGEWA association also addressed current issues of European chemical policy and the strategy for sustainability. A new feature of the lecture programme was a session on sustainable packaging.

We now know how very much we missed the “live” lecture event and the personal contact of congress participants and exhibitors. Thank you!

Interested professional colleagues remained loyal to the congress and the parallel trade exhibition. And the popularity of the congress and the trade exhibition had indeed grown. The

statistics show participation by 3,175 attendees from 60 different countries. Some 302 companies exhibited their profile and presented their new products at the trade exhibition. A total of 153 presentations were held in parallel sessions.





Picture from left to right: A. Nadarzynski, A. Neutsch, Dr. H. J. Scholz, M. Hensel, S. Mussler

## Young Researchers' Award Ceremony of the SEPAWA® e.V.

One highlights every year is the honouring of special achievements. The 1<sup>st</sup> Chairman of SEPAWA® e.V., Dr. Hans Jürgen Scholz, performed the appreciations. The annual SEPAWA® **Young Researchers' Award** fulfils one of the most important goals of SEPAWA® e.V. to promote the education of young professionals especially. The award is given to students for outstanding bachelor, master and doctoral theses. The jury selected 5 prize winners from the submitted theses. Specifically, two bachelor's thesis and three master's theses were deemed worthy of the award.

**The 1<sup>st</sup> prize** in the category "Outstanding **Bachelor's Graduate**" was awarded to **Ms. Selina Mussler**, Technische Hochschule Ostwestfalen-Lippe, for her work with the title: "Development of a „microplastic signal light“ for cosmetic products". **The 2<sup>nd</sup> prize**

was awarded to **Ms. Marie Hensel**, Henkel AG & Co. KGaA, for her work. The title of the thesis is: "Investigation of defined aged keratinous fibers by zeta potential measurement".

**The 1<sup>st</sup> prize** in the category "Outstanding **Master's thesis**" had been awarded to **Ms. Nele Marie Dallmann**, Henkel AG & Co. KGaA, for her work entitled: "Multiparametric Investigation of Logwood as a Natural Color Source for Hair Dye (*Haematoxylum campechianum* L.)". **The 2<sup>nd</sup> prize** was awarded to **Ms. Alexandra Neutsch**, evident ingredients GmbH & Universität Hamburg, for her work entitled: "Development of a natural cosmetic-compliant solubilizer blend". The honour for the **3<sup>rd</sup> prize** was accepted by **Ms. Alexandra Nadarzynski**, Cosphatec GmbH, for her work. The title of the thesis is: "Use of multifunctional raw materials to reduce the water activity of cosmetic formulations".



Innovation Award Winners 2022

## SEPAWA® Innovation Award Ceremony

Innovations are crucial for growth and competitiveness in our markets and form the basis for successful and sustainable business. For the tenth time, this year's **SEPAWA® Innovation Award** was presented to three winners from the cosmetics and detergents sectors. The prize is intended to provide impetus for active idea management in the member companies of SEPAWA® e.V. and to raise public awareness of a valued innovation.

A neutral, independent jury consisting of 7 members of the scientific advisory board of SEPAWA® e.V., the board and the advisory board of SEPAWA® e.V. selected 3 prize winners from 31 submitted proposals. The prize consists of a certificate and a trophy showing the SEPAWA® wave in stylised form. The aluminium body of the trophy has given way to a sustainable wooden body.

**The 1<sup>st</sup> prize** was awarded to the company **Krüß GmbH Hamburg**. The title of the award-winning novelty is: "Ayríís – The revolution for contact angle measurements". The award was received by Marisa Asmuss & Malte Snoyek. **The 2<sup>nd</sup> prize** was awarded to the company **Holiferm UK**, represented by Richard Lock. The work is entitled: "Gravity step separation fermentation method of producing sophorolipids". **The 3<sup>rd</sup> prize** went to the company **Connect Chemicals Group & P2 Science Inc.** entitled: "Citropol®, sustainable & performing silicone alternatives". Ms. Olechowski received the award.

In keeping with tradition, the prizes were awarded at the beginning of the After Event show, this year by Robert Fischer (Verlag für chemische Industrie). The applause of more than 900 participants could not be ignored.



## Ceremony Young Scientists' Award of the GDCh Division of Detergent Chemistry

Mrs Prof. Dr. Birgit Glösen, University of Applied Sciences Köln, Chairperson of the GDCh Division of Detergent Chemistry, awarded the **Prize of the Division 2020** to **Dr. Astrid Rohrdanz**. The laudatory speech was held by Marcus Gast, Umweltbundesamt Dessau-Roßlau.

In keeping with tradition, the GDCh Division of Detergent Chemistry awarded 3 young scientists for excellent work with special relevance for the development of detergents. The award ceremony had been held by Mrs Prof. Dr. Birgit Glösen.

The prize for the **best PhD thesis** was awarded to **Dr. Christoph Brudl**, claro products GmbH & Technische Universität Graz. The title of the thesis is: "Going green and clean – Is it possible?". Some sections from the abstract as follows: "... the scope of the thesis was to evaluate biodegradable polycarboxylates in order to formulate a biodegradable dishwashing detergent with a comparable performance. The main part of this work was the development of a builder- and surfactant-system that results in as little spotting and filming as possible. After many different formulations it was possible to create, with the help of different analytical methods like SEM, Raman, IR, AFM and XPS, a formulation equally good in its performance compared to common benchmark products".

The prize for the **best Master's thesis** received **Ms. Hailey Poole**, Universität Stuttgart & Queen's University Kingston Canada. The title is: "CO<sub>2</sub>-Switchable Foaming Agents". The corresponding abstract as follows: In industry, foams are often required for part of a process but can be detrimental in downstream processes. Traditionally to control undesired foam, antifoaming and/or defoaming agents are used. Unfortunately, these additives change the composition of the foaming solution preventing the recovery and reuse of the foaming agent. A solution to having foam control without additional chemicals is using a molecule that can be switched between being a surfactant and being a defoaming agent. Such molecules are called switchable surfactants, they can be switched



Dr. Christoph Brudl

between a form that has significant surface activity (the "on" form) and a form that has less surface activity or less capability of stabilizing a foam (the "off" form). CO<sub>2</sub> is an advantageous pH trigger for this process as it is non-toxic, inexpensive, and does not lead to salt build-up as can occur with acids and bases. While the bulk of attention has been on CO<sub>2</sub>-switchable surfactants with switchable head groups, we have designed CO<sub>2</sub>-switchable surfactants where the surfactant head group is permanently anionic, cationic, or non-ionic and the CO<sub>2</sub>-responsive group is placed in the middle of the hydrocarbon tail. Under air, the CO<sub>2</sub>-responsive group is neutral and acts as part of the hydrophobic tail. When this form of the molecule is added to water and energy is applied, a stable foam is produced. In the presence of CO<sub>2</sub>, the CO<sub>2</sub>-responsive group in the tail becomes protonated and reduces or disrupts the amphiphilic nature of the molecule, which in turn, disables the molecule's ability to stabilize a foam. These surfactants are advantageous in industrial applications where foam is needed under air. When the foam is no longer desirable, CO<sub>2</sub> can be added to the system, thus providing easier post-processing and recycling of the surfactant solution.

The prize for the **best Bachelor thesis** was awarded to **Ms. Sophia Botsch**, University of Stuttgart. The title is: "Influence of the surfactant concentration on the structure of porous polystyrene synthesized via emulsion templating".

The abstract as follows: The polymerization of monodisperse water-in-monomer emulsions results in monodisperse macroporous polymers with non-spherical pores that have layered pore walls. We identified that this morphology is caused by surfactant diffusion and phase separation during polymerization. Solid polymer foams combine the advantageous properties of foams and polymers. The resulting materials are both lightweight and insulating. However, the properties to some degree depend on the structure which is not easily customized using common production methods of polymer foams. Using monodisperse water-in-monomer emulsions as polymerization templates solves this issue, though also raising another question: why does the shape of the pores change from a spherical template to a polyhedral polymer foam when a water-soluble initiator is used? We studied the morphology of macroporous polymers with varying surfactant mass fractions that were polymerized from emulsion templates. The structure as well as size of the pores and the thickness of the layers was determined via scanning electron microscopy. In addition, a ternary phase diagram that simulated the polymerization was conducted to study the response of monomer/surfactant mixtures to polymerization. We found that the higher the surfactant concentration, the thicker the porous inner layer of the wall, thus indicating a diffusion process of excess surfactant molecules into the inner monomer phase caused by phase separation between monomer and polymer during polymerization. This process also causes some of the surfactant molecules to diffuse onto the water-monomer interface, thus enabling the latter to increase its area and changing the pore shape from spherical to polyhedral.



## SOFW award

The SOFW award was given to the 3 best articles in the SOFW Journal (SOFW Journal issues November 21 to October 22). The winners were honoured at an award ceremony. Robert Fischer, editor of the SOFW Journal, presented the prizes.

**1<sup>st</sup> place was won by BASF** with the article entitled: “Nano or Non-Nano: the Key Aspect of the Measurement Method”. The prize was accepted by Dr Myriam Sohn and Prof. Dr Bernd Herzog.

**2<sup>nd</sup> place went to FRAMES Formulation Intelligence** with the article “Optimising Your Resources for Market Intelligence and Product Development”. Jean-Paul Janssens and Roel Hermant accepted the prize.

**3<sup>rd</sup> place went to DSM.** Julijana Ivosevic-Zaper and Olivier Garet from DSM accepted the award for “New Method for Connecting Sunscreens with Consumers via a Relative Eco-score”.

## Keynote Address

This year's lecture was given by **Jens Bode | Der Innologe®**. A wide audience was excited about what the innologist told us about innovation under the title: “The I-Point. With Your Own Talent, (Trend)Inspiration & Desire to Innovate”. Here are a few key points from the presentation:

An ‘i’ for relevant inspiration, an ‘i’ for your individual talent and an ‘i’ for impact, and that with a large portion of intrinsic motivation towards the desire to innovate.

- Your unique talent & a creativity technique that can be used directly
- Sense of Urgency or ‘what is actually going on out there?’
- A loud commitment and ‘yes’ to a positive culture of innovation and free resources
- Innovating is easy, but ...
- Inspirations & the treasure-hunter-mindset
- 12 top trending search fields
- Final & 5 (mental) hacks to innovation.



Keynote Lecture 2022 – Jens Bode | Der Innologe®

## The lecture event – a compilation of selected key topics

The lecture event excellently reflects the scientific foundation as well as the breadth of technical applications of our detergent/cleaning agent, cosmetics and perfume industries.

The European Detergents Conference, which was conceived by the “Division of Detergent Chemistry” section of the German Chemical Society, saw 12 scientific lectures presented on the subject of “Interface Interactions: Experiment & Modeling”. The presentations were accompanied by topics from the award-winning doctoral thesis by the award winner.

Some 28 papers were presented during the SEPAWA® Scientific Conference on topics covering the latest research results from our detergents/cleaners, cosmetics and perfumes industries, including their regulatory framework.

The lecture block of the DGK conference, the Cosmetic Science Conference, hosted 19 scientific lectures. The theme of this year’s CSC was “Cosmetics 360 Degrees”. The aim of this conference was to present the development of cosmetic sciences “holistically” (and with a focus on sustainability).

The lecture blocks in the Forum for Innovation are a firmly established part of congress programme. This year, 92 speakers took the opportunity to present their latest developments. The entire lecture programme was complemented by a total of 39 poster presentations, including 14 science-orientated posters related to EDC, 14 related to the SEPAWA® e.V. conference and 11 with application-focused content. The posters were the work of young scientists from universities and academic institutes, as well as employees from industrial research and institutional bodies in our sectors.

The Fragrance Session on Thursday morning focused on topics of the sustainability and naturalness of fragrances, and the physiological and emotional response to fragrances. The DGP sponsorship award was also presented. This year’s award winner was Akshita Joshi (Technical University of Dresden) who received the certificate for her work on “Neural Associations Between Well-being and Odor Perception”.



## The 18<sup>th</sup> European Detergents Conference (EDC)

by GDCh Division of  
Detergent Chemistry

**In 2022, the EDC focuses on “Interface Interactions: Experiment & Modeling”.**

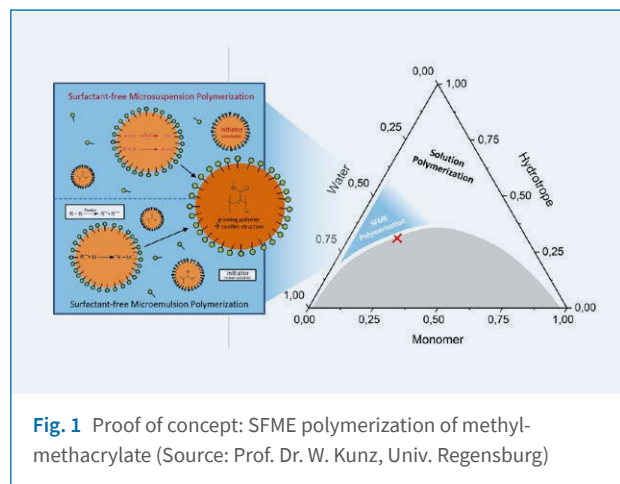
The EDC want to address experimental and theoretical investigations of interfaces, for example in foams and emulsions, and in this context discuss aspects like interface stability, transport processes and interactions at interfaces.

Now following a selection from the lecture block from the 18<sup>th</sup> European Detergents Conference (Scientific Conference – Fundamental Research)

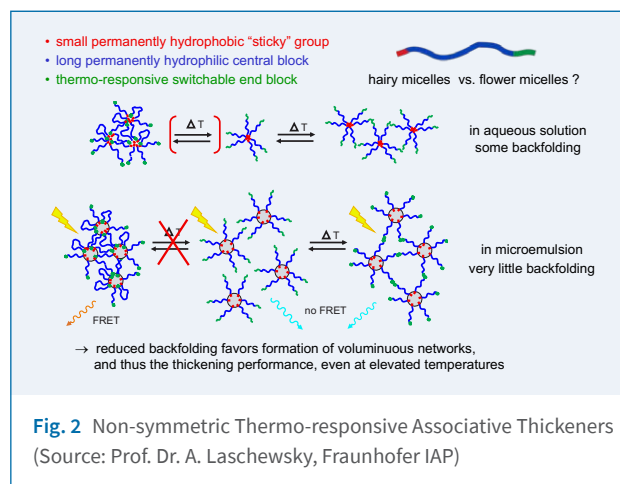
## Microemulsions With and Even Without Surfactants and Some Practical Applications

Prof. Werner Kunz  
(University of Regensburg)

To mix an aqueous (polar) and a nonpolar (oily) phase to a homogeneous, transparent phase, usually surfactants are used. Then, typically micelles occur or even liquid crystalline structures if a high amount of surfactant is present. Alternatively, water and oil can be mixed by so-called hydrotropes. SXS or SCS are prominent examples, but sometimes even ethanol can be sufficient. Usually, much more hydrotrope is necessary to get a homogeneous, transparent phase than with surfactants. On the other hand, surfactants may be unwanted, because they may perturb the product or lead to environmental or toxicity problems. For a long time, it was common sense that hydrotropes cannot form micelles or any other nanostructures with interfaces between oily aggregates and the aqueous surroundings in the stable transparent mixed phase. However, this is not always true. We could prove that sometimes even hydrotropes as simple as ethanol can form interfaces in oil-water mixtures. Such interfaces can be crucial for various chemical and biochemical reactions. For example, emulsion/microemulsion polymerisation can be done in such mixtures even in the absence of surfactants and the growth and final size of the polymers can be finely controlled just as in the presence of surfactants. The advantage is that the final product does not contain any traces of surfactants that could negatively influence the properties of the polymer (Fig. 1).



**Fig. 1** Proof of concept: SFME polymerization of methyl-methacrylate (Source: Prof. Dr. W. Kunz, Univ. Regensburg)



**Fig. 2** Non-symmetric Thermo-responsive Associative Thickeners (Source: Prof. Dr. A. Laschewsky, Fraunhofer IAP)

## Thermo-responsive Polymeric Amphiphiles as “Smart” Rheology Modifiers for Aqueous Solution and Microemulsions

André Laschewsky (Fraunhofer Institut für Angewandte Polymerforschung & Universität Potsdam)

Associative thickeners are typically composed of a hydrophilic polymer (“A”) framed by two hydrophobic end groups (“stickers”, “B”). To confer new properties to such systems, we explore amphiphilic block copolymer poly(acrylamide)s BAB\*, which contain one permanent hydrophobic sticker B, and one thermo-responsive “switchable” sticker B\*. Above a specific temperature, this design results either in the formation of flower-like micelles via intra-micellar back-folding, or of micellar networks via inter-micellar bridging. In order to elucidate the mechanism of action, we functionalize the polymers with a naphthalimide dye on the permanent hydrophobic sticker end, and a coumarin dye at the opposite chain end. This fluorophore pair undergoes efficient Förster resonance energy transfer (FRET), enabling the investigation of back-folding vs. bridging during the thermally induced coil-to-globule phase transition of the polymers. Using a tailor-made surfactant-like chain transfer agent (CTA), the triblock-like polymers are synthesized from N,N dimethylacrylamide (DMA) as permanently hydrophilic and, e. g., N-isopropylacrylamide (NIPAM) as thermoresponsive blocks via RAFT polymerization. Their aggregation in aqueous solution as well as in o/w microemulsions is studied by fluorescence, turbidimetry and scattering methods, demonstrating how the chemical structure of the blocks influences phase behavior, self-assembly, and rheology (Fig. 2).



## Oil-Water-Surfactant Systems Tuned by the Exchange of EO Groups with CO<sub>2</sub> Groups in the Surfactant

Rahel Marschall  
(Technische Universität Berlin)

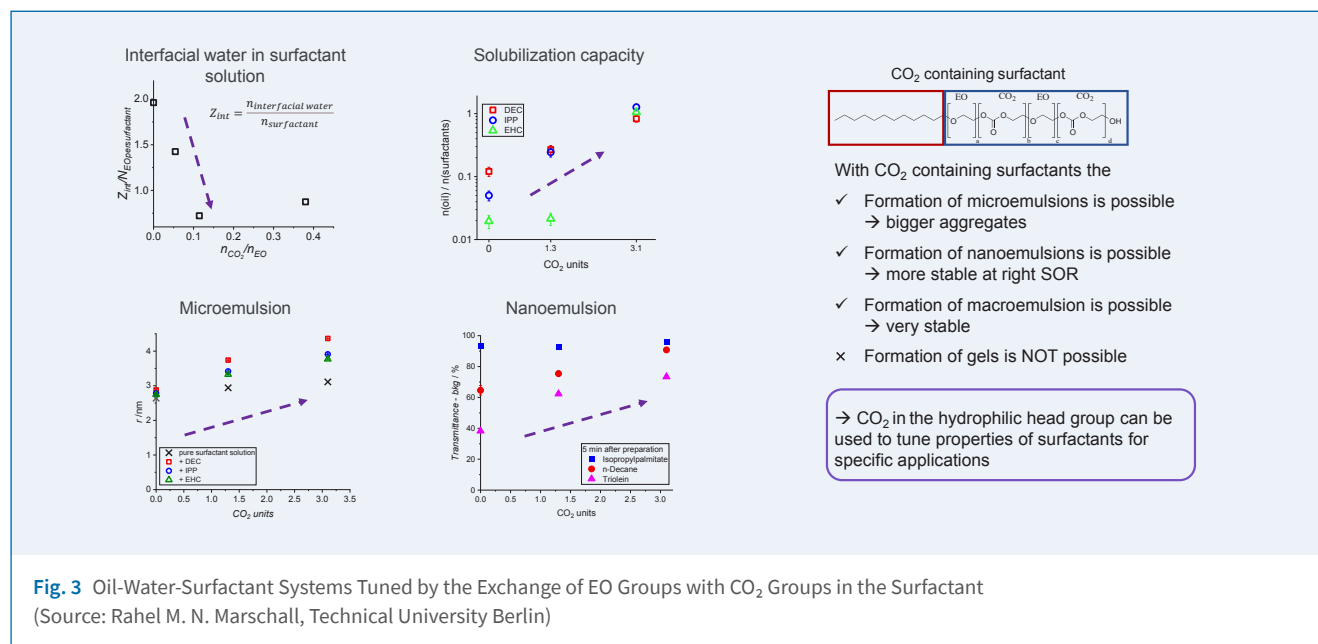
Investigation of carbon dioxide (CO<sub>2</sub>) as sustainable resource is of fundamental interest for research and industrial applications. It can be used as a building block in chemical compounds such as polymers or surfactants. Substituting ethylene oxide (EO) units in abundantly produced non-ionic EO-surfactants by CO<sub>2</sub> can increase the sustainability and save natural and fossil resources. Similarly interesting, introducing CO<sub>2</sub> gives a new tuning parameter for non-ionic surfactants, allowing to better match particular application requirements and thereby a more economical consumption and potentially even opening up pathways for novel formulations. The possibility to use the

CO<sub>2</sub> content to tune the properties in different formulations e.g. microemulsions, nanoemulsions, macroemulsions and surfactant gels has been investigated using industrial relevant oils (decane, isopropylpalmitate, bis(2-ethylhexyl)carbonate) with different polarity. The influence of the CO<sub>2</sub> groups on the physicochemical properties of those systems have been investigated by light scattering (LS), interfacial tension measurements (IFT), conductivity measurements and fluorescence imaging. It can be seen, that the use of CO<sub>2</sub> containing surfactants lead to different results as systems with pure EO surfactants (Fig. 3).

## Interfacial Molecular Modeling for Textile Maintenance: Color Protection, Anti-greying, and Strengthening

Joseph Cendagorta (Ashland LLC)

Repeated washing and normal wear and tear can minimize the strength and appearance of textiles. Consequently, various ingredients and processes have been developed to prolong the textile lifecycle. Textiles are derived from both synthetic and natural sources encompassing diverse chemistries. Thus, finding compatible and sustainable ingredients to perform the desired maintenance properties can be a difficult, resource-consuming task. Given the market demand for sustainable products in the personal care industry, the use of digital technologies as a resource-efficient tool has grown tremendously. At Ashland, we pride ourselves on the implementation and use of modeling to enhance our innovation pipeline. The Digital Innovations team has implemented advanced simulation methods within our in silico laboratory to provide insight and direction to problems faced in our targeted industries. Here, we present various scales of molecular modeling to uncover the unique molecular interactions of active ingredients with representative textiles. We highlight next-generation sustainable technologies that improve important maintenance properties of textiles including color protection, anti-greying, and strengthening. For color protection and strengthening, all-atom molecular dynamics simulations elucidate the interfacial interactions of ingredients with the textile surface. For anti-greying, coarse-grained molecular dynamics simulations uncover the complex mechanism of anti-soil redeposition of various soils onto the surface of textiles.



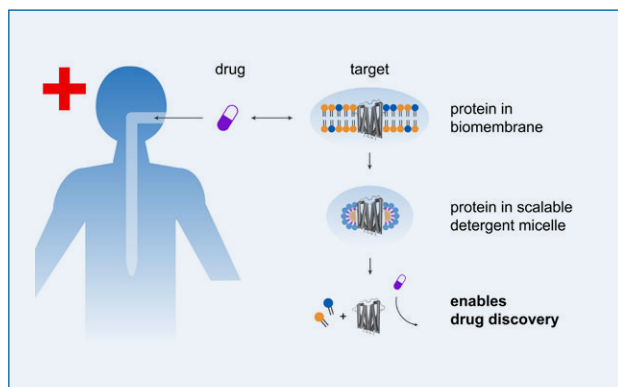
**Fig. 3** Oil-Water-Surfactant Systems Tuned by the Exchange of EO Groups with CO<sub>2</sub> Groups in the Surfactant  
(Source: Rahel M. N. Marschall, Technical University Berlin)



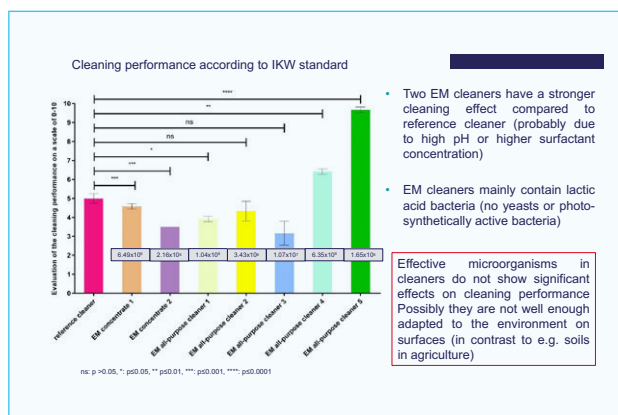
## Solving the Scalability Problem of Detergents

Dr. Leonhard H. Urner  
(Technische Universität Dortmund)

The utility of detergents for applications is determined by their overall polarity and shape. The ability to systematically scale both detergent properties across a large chemical space has not yet been achieved. Regardless of the application, optimal detergents are therefore routinely identified by empirical tests, which can drive up the time and costs of projects. Here, this fundamental challenge is addressed by introducing a scalable detergent design. First, combinatorial synthesis is presented to enable the rapid preparation of hybrid detergents that differ gradually in terms of their polarity and shape. Second, established theoretical models are applied to monitor gradual changes in overall polarity and shape of hybrid detergents, such as the hydrophilic-lipophilic balance (HLB) and the packing parameter. To finally exemplify utility, scalable hybrid detergents are used to solve a medically relevant question: Does the structure or the concentration of detergents define the ability to maintain membrane protein function throughout purification? The results obtained in the context with membrane protein research demonstrate how scaling the polarity and shape enabled by hybrid detergents can advance structure-property studies for the benefit of individual applications. This work is permitting access to an unexplored part of the detergentome (totality of all detergents) and setting the groundwork for a new way of thinking in the field of detergent design. Structural scalability will facilitate the optimization of detergents for challenging future applications (Fig. 4).



**Fig. 4** Structural scalability to optimize detergents  
(Source: Dr. Leonhard H. Urner, Technical University Dortmund)



**Fig. 6** How effective are cleaners with effective microorganisms  
(Source: M.-K. Zinn, Universität Duisburg-Essen & Hochschule Rhein-Waal)

## Scientific Conference – Home Care

### How Effective are Cleaners With “Effective Microorganisms”?

Marc-Kevin Zinn  
(Universität Duisburg-Essen & Hochschule Rhein-Waal)

Cleaning products that contain microorganisms as active components (microbial-based-cleaning-products) are now commercially available in numerous variants. In addition to *Bacillus* spores, some of these products contain, so-called “Effective Microorganisms” (EM), which are supposed to be able to displace pathogenic germs on various surfaces. To test the effectiveness of EM-based household cleaners, the microbial composition was analysed using MALDI-TOF and sequencing (16S / ITS). In addition, the cleaning performance according to the IKW standard and the bactericidal and fungicidal effect were tested in accordance with DIN EN 13697. Co-cultivation tests and long-term effects on pathogens simulating repeated application were carried out with two EM-solutions in the IKW reference cleaner (Fig. 6).

## The Biosurfactant di-Rhamnolipid in Liquid Laundry Detergents

Dr. Jochen Kleinen  
(Evonik)

Today's liquid laundry detergents mostly consist of mixtures of non-ionic and anionic surfactants as e.g. Laureth-7 (C12E7) and Sodium Lauryl Ether Sulfate (SLES), enzymes and additives like stabilizers and builders. These mixtures had been optimized for decades with respect to ease of formulation, stability and, most important for consumer, performance. We now developed a laundry detergent with reduced amount of additives and which is solely consisting of a di-Rhamnolipid as surfactant. To develop a formulation based on the biosurfactant di-Rhamnolipid, the interaction of the di-Rhamnolipid with the individual components in the formulation as well as during the washing process was analyzed by different methods. These methods range from application tests, enzymatic assays to analytics and physico-chemistry. The mildness towards enzymes and the immunity of di-rhamnolipid towards water hardness allowed for a reduction of the complexity of the formulation paired with an increase in stability of the enzymes. The interaction of the di-Rhamnolipid with fabric was also found to be different compared to conventional surfactants. Conventional surfactants alter the surface properties of the fibres which reduces redeposition of dispersed soil during the washing process, this task is often boosted by polymers and these polymers are also mandatory as synergistic additives in the formulation based on di-Rhamnolipid. Surprisingly, di-Rhamnolipid shows no synergies with conventional surfactants so that washing performance tested in full-scale wash test was best if only di-Rhamnolipid was used as surfactant which might lead to a new era of laundry cleaning.

## Mimicking Our Bodies: Usage of Innovatively Modified Smectite Clays to Fight Germs with Hypochlorous Acid

Dr. Jessica Gödeker (BYK-Chemie GmbH)

Hypochlorous acid (HClO) is produced by the white blood cells of all vertebrate animals as part of a mechanism that evolved 500 million years ago to fight against intruding pathogens. This makes the weak acid a nature-like option for disinfection. HOCl is regarded as a very safe material because it readily decomposes to produce NaCl and oxygen. Its very high efficiency as anti-microbial agent is used in multiple cleaning applications as well as in wound and topical care. Nevertheless water-thin solutions of hypochlorous acid have the disadvantage that they quickly flow away and restrict the potential. Hydrogels overcome this drawback and allow for improved and a more sustainable usage. Hypochlorous acid hydrogels release the active

chlorine at a much slower rate, bind the water which provides protection against drying and increases the contact time on the surface. The high reactivity makes it challenging to find a rheology modifier to form these hydrogels. Hypochlorous acid must be stabilized at a pH range of 5 to 7 to maintain chemical stability. It is degraded by organic chemicals and by transition metal ions. Synthetic smectite clays are highly suitable for producing these hydrogels. They stabilize the hypochlorous acid within the required pH range and are free from components that affect the HClO activity. These synthetic layered phyllosilicates are unique additives manufactured from naturally occurring inorganic mineral sources. Their crystals become arranged into stacks but when dispersed in water they separate in disc-shaped forms. Due to electrostatic forces, the crystals build then a 3D network ("house-of-cards" structure), that is responsible for the rheological effect. Certain innovations in modification of this synthetic phyllosilicate clays allow them to even tolerate high amounts of electrolytes. Quantitative suspension tests with different standard bacteria and virus types showed no negative impact on the biocidal activity (Fig. 14).

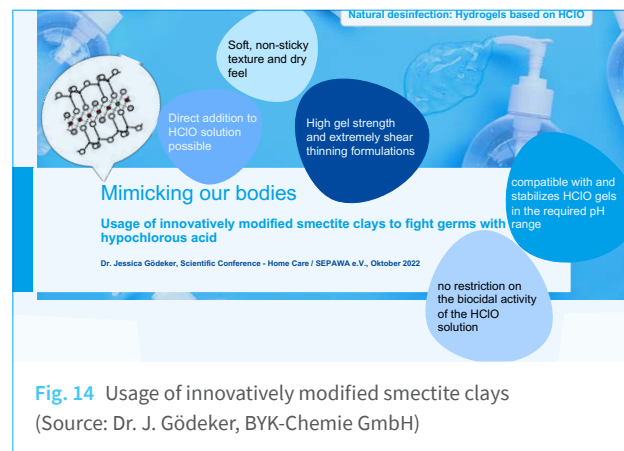


Fig. 14 Usage of innovatively modified smectite clays  
(Source: Dr. J. Gödeker, BYK-Chemie GmbH)

### Innovation in Skin Care Product Testing: The Suction Blister Method

Dr. Astrid von Seebach  
(SGS Institut Fresenius GmbH)

There are many approaches to studying the effects of skin care products. In addition to biophysical parameters, such as skin moisture, depth of wrinkles and skin elasticity, molecular biological analyses have also become increasingly important for the cosmetic industry and for dermatological research. By preparing skin samples after an *in vivo* product treatment, the product's *in vitro* efficacy can then be easily examined using a range of molecular biological methods. Suction blisters offer a far less invasive sampling technique than the common alternative, punch biopsies. Both the blister fluid, which is largely derived from the interstitial fluid, and the blister roof, which contains the epidermis, can be used to analyze different biomarkers in the skin. Suction blisters therefore provide key insights when investigating a wide variety of product claims (Fig. 15).

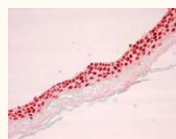


Product treatment  
*in vivo*



Stress (optional):

- Cigarette smoke
- UV treatment
- Blue Light



Molecular biological  
analyses (e.g.):

- ELISA Assays
- Immunohistology
- PCR
- ATP Assay



Claim Support (e.g.):

- Anti-pollution
- Anti-oxidative Effect
- Cell Turnover
- Energy Level

**Fig. 15** The Suction Blister Method  
(Source: Dr. Astrid von Seebach, SGS Institut Fresenius GmbH)

### Evaluation of Process Rheometer for Automated Viscosity Control of Non-Newtonian Surfactant Products

Anders L. Østergård  
(Fluidan ApS)

Personal care products like bath soaps and shampoos are manufactured in high volume continuous operations. The products are manufactured on a tight schedule and with frequent changeover between product varieties, each changeover representing a new batch. Consumers expect a highly consistent quality from their favourite brands. Quality parameters include e.g. colour, odour, material composition, pH and viscosity. These parameters are measured regularly on the final bulk after production, making it impossible to automate a feedback loop to the ongoing production, and delaying the final batch release. Introducing automated online analytics enables a tighter process control and allows for faster release of each batch. This presentation describes the testing of an online process rheometer aiming at automated viscosity control for non-Newtonian surfactant products. Many process viscometers are only able to perform single point measurement and are not able to convey/characterize the complex flow behaviour of non-Newtonian liquids like soaps and shampoos. A new automated capillary rheometer has been evaluated in comparison with the current laboratory method. The capillary rheometer operates by small liquid samples consecutively flowing into the instrument, and the viscosity profile is measured having full control of temperature and shear rate. The study has demonstrated that the automated capillary rheometer can precisely and accurately measure the viscosity in the range of shear rates and viscosities of interest. Moreover, the instrument is simple to operate and can maintain itself clean, and it is therefore suitable for implementation as a process rheometer.



## The Circular Sustainable Content Index – How Smart Indicators Guide and Accelerate the Sustainable Transformation

Thomas Müller-Kirschbaum (Circular Valley Stiftung)

Innovation and sustainability are the fundamental drivers of the transformation into a climate-neutral circular economy. This applies in particular to the consumer goods industry. Commercial customers like end users expect sustainable offers. Superficial messages are no longer sufficient. The differentiation lies in credible quantification. At the same time, the partners along the value chain need reliable and uniform parameters as guard-rails for innovative product developments. Design for circularity, environmental behavior, proportion of non-fossil-based car-

bon, shares of undesirable accompanying substances, life cycle analysis, energetic footprint. Among other things, ingredients and packaging materials as well as the products themselves are measured on these key figures. While within the value chains technically trained can and also want to deal with the individual parameters, consumers are simply overwhelmed. On the one hand, there are already a large number of existing labels. This includes national and international eco-seals: the German Blue Angel or the EU eco-label. Or information about the proportion of recyclates. However, the latter usually only refers to the packaging. At the same time, bio-based ingredients are awarded without proven by life cycle analyzes that they really represent an environmental advantage over the substituted materials. In order to accelerate the urgently needed transformation, it is necessary to simple and credible holistic evaluation sizes. The lecture presents new concepts of standardization. Ideally, a circular sustainable content index can be the basis for an internationally – at least Europe-wide – applicable labeling. The index must be based on clearly defined dimensions, scientifically accepted calculations and comprehensible links, as is explained in the lecture. In addition to scientific and technical challenges, political and economic hurdles must be overcome for implementation. The lecture makes a new proposal, as classic ways for alignment have proven to be clearly too slow (Fig. 10).

### Circular Sustainable Content Index (CSCI) (algorithm in progress)

$$\text{CSCI} \sim \frac{\text{CC}}{\text{EC} + \text{CF}}$$

CC: Circular Content (%)  
EC: Energy Consumption (kWh)  
CF: Carbon Footprint (tons CO<sub>2</sub>e)

- CSCI: high value signals higher level of sustainability
- CSCI: allows to differentiate comparable products

Fig. 10 The Circular Sustainable Content Index  
(Source: Prof. Dr. T. Müller-Kirschbaum, Circular Valley Foundation)

## “Generic Approach to Risk Management” and Other Shady Elements of the Chemical Strategy for Sustainability

Dr. Alex Föller (Verband TEGEWA e.V.)

The European Commission’s conception of a „Chemical Strategy for sustainability“ will challenge, if not threaten the chemical industry and many of their supply-chains, as it abandons the well-known ground of successful chemical assessment and turns into a more fuzzy concept which contains many elements that are not based on science and facts. Abstract terms, for example „generic approach to risk management“, „essential use concept“ or „safe and sustainable-by-design“ provide space for gambling, excessive requests from NGO’s and expectations from service providers in regard to new business models that will add costs to the industrial production without any significant improvement for human health or the environment. A wave of regulations will come into force within the next years that will affect the producers of chemicals and their industrial and professional customers. The presentation will offer an overview of the major elements of the strategy and provide examples that demonstrate how the members of TEGEWA anticipate this strategy and how they prepare for years to come (Fig. 11).

- A growing number of substances will be subject of political discussions and decisions
- Exposure and Risk assessments for individual chemical substances will step-by-step be substituted by assessments of groups of substances charged with emotions
- The environmental and human benefit of CSS is shady and questionable
- The impact of the competitiveness of the EU chemical industry is without fail
- SME will suffer whereas the big players will re-allocate their production

Fig. 11 TEGEWA Conclusions  
(Source: Dr. A. Föller, Verband TEGEWA e.V.)

## REACH Polymers Registration – What are the Actions and Next Steps for Downstream User Formulators?

Giulia Sebastio

(Downstream Users of Chemicals Co-ordination Group)

The European Commission is looking to revise the current exemption to register polymers under the REACH (EC) No 1272/2008 Regulation. Formulating downstream industries – like detergents and cosmetics – have specific interests and concerns due to their place in the supply chain and the use and benefits of polymers in these products. The Downstream Users of Chemicals Co-ordination Group (DUCC) is a platform of 11 European associations which represent “downstream” industries ranging from cosmetics and detergents to aerosols, paints, inks, toners, pressroom chemicals, adhesives and sealants, construction chemicals, fragrances, lubricants, crop protection and chemical distributors industries. The group’s main objective is to contribute, with a common voice, to the successful implementation of the requirements of the REACH and CLP Regulations. DUCC has been acting to share the “downstream user” perspective in a common voice and this presentation will cover the updates to this topic, actions being taken and next steps. What can industry do further manage polymers registration and work towards proportionate action?

## Scientific Conference – Personal Care (DGK e.V.)

### Cosmetic Science Conference by DGK e.V.: “Cosmetics 360 Degrees”

“Cosmetics 360 Degrees”: The aim of this conference is to present the development of cosmetic sciences “holistically” (and around the focus of sustainability).

Mrs Dr. Andrea Weber, Chairperson of the DGK, welcomed all listeners and moderated the keynote speech.



### Keynote: Power of Influencers

Dr. Chem. Eng. Alina Nanu

(Eurofins Evic Product Testing Romania S.R.L.)

Cosmetics, part of our days, used to improve our quality of life, our self-esteem, help us to integrate in the modern society, but how to make the difference as manufacturer between our product and the others? How to choose the most appropriate for us as a consumer? Do we choose in the same way no matter the region, age or gender? Which is the trigger for our choices as consumers? What is the most powerful tool to push our product in front, as manufacturers? The solution seems to be on the new-born world called internet, that supposed to be accompanied with a lot of responsibility ... and the winning product of the new marketing era, are influencers, now omnipresent in our modern life due to social network, adds. Cosmetics are the favorite products in influencing, apparently since everybody is using, everybody has a word to say, but how valid are their opinion, should we guide our decision to use something on our body based on that? Do we realize when is an authorized opinion and when is just a testimonial? So, influencers, are they good or bad? Should we trust them? Are they human? The new present is on fast-forward bombing us with information: buy

this or that, searching engines from browsers follow our interest suggesting similar products in real world or virtual ones. Do we need new regulations? The answer is a click away.



## Different Shades of Galenics

Prof. Dr. Andrea Wanninger  
(Hochschule Niederrhein)

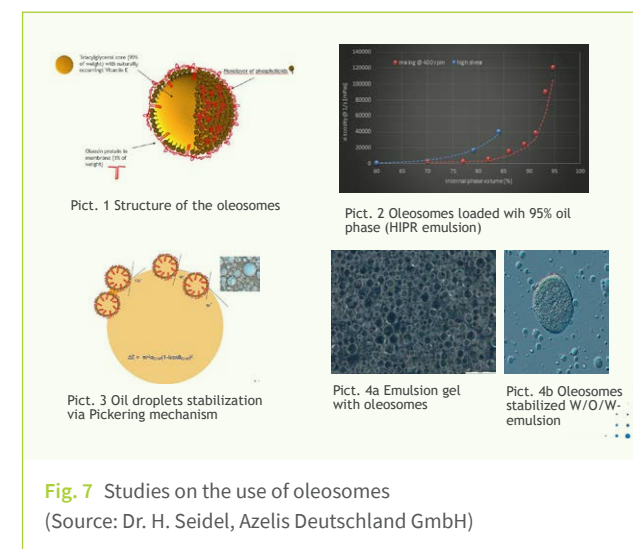
The Specialist Group Galenics of DGK e.V. and its activities are portrayed in this presentation. It is a group of university and industry experts in Personal Care, including ingredient manufacturers and cosmetics manufacturers. Goals of the Specialist Group are characterisation, understanding and optimisation of cosmetic formulations with regard to selection and screening of ingredients, formulation development, manufacturing technology, stability, and efficiency. Due to intensive exchange of experiences of the group members, several research projects have been carried out during the past years, including penetration and liberation studies of model active substances (Avenanthramides, Glycyrrhizic Acid, Salicyloyl Phytosphingosine, Resveratrol, Apigenin). Just recently, two guideline formulations for skin care have been developed. A selection of the most important and the new scientific projects – the „Different Shades of Galenics“ – was presented. The group „Galenics“ also carries out the DGK workshop „Galenics, Liberation and Effect“ which includes presentations as well as a practical part in the lab.

## Studies on the Use of Oleosomes in Cosmetic Formulations

Dr. Holger Seidel  
(Azelis Deutschland Kosmetik GmbH)

Oleosomes: Natural high-performance carrier systems for cosmetics. Innovative, sustainable raw materials are novel and they provide additional benefits for the user/customer due to their outstanding performance. Oleosomes fulfil all the requirements of a modern high-tech carrier system for cosmetic applications. They are contained in all plant seeds and serve as a natural energy store for the seeds during germination. Oleosomes are microscopic spheres of plant oils and vitamin E surrounded by a single layer phospholipid/protein membrane. They are isolated as a 65% aqueous dispersion of oleosomes using a chemical-free, sustainable manufacturing process. Gentle separation and purification techniques enable the recovery of high performing NATRUE compliant oleosomes and proteins in their natural state. Compared to other carrier systems, such as liposomes, SLN, porous solids, etc., oleosomes can absorb large amounts of lipids with low energy input. Their performance is demonstrated, among other things, by their high load ability with solid and liquid organic sun protection filters. Initial studies have shown that the efficiency of organic filters in sunscreen formulations is significantly higher if they have been incorporated into oleosomes beforehand. The functionality of oleosomes depends largely on their compatibility in different cosmetic applications. Based on microscopic and rheological test results, the influences of oleosomes on emulsion gels and emulsions with liquid crystalline gel network

structures (non-ionic, anionic, cationic) are discussed. Furthermore, results on the use of lipid- and active-loaded oleosomes in Rinse-off products with different surfactant systems are presented. A further formulation approach describes the use of oleosomes in oil-based formulations in the form of O/W/O emulsions (Fig. 7).





Modelling, simulation and predictive AI: new digital services in personal care

Dr. Sandip Bhattacharya  
SEPAWA Congress Berlin, 26-28 October 2022

Care  
Creations. | BASF  
We create chemistry

Fig. 8 Modelling simulation and predictive AI – new digital services in personal care (Source: Dr. S. Bhattacharaya, BASF)

## Modelling, Simulation and Predictive AI: New Tools in Personal Care

Dr. Sandip Bhattacharya  
(BASF Personal Care and Nutrition GmbH)

We can expect exciting digital and AI tools in the future in personal care, due to the advent of ever-increasing computing power, better predictive algorithms coupled with our extensive knowhow on cosmetic ingredients. In this lecture we will present our latest activities in Modelling & Simulation resulting in predictive tools, that help formulators to select the right products in their personal care products. We will share in detail the learnings made by us, in this journey. We have recently launched a new digital tool on Emollients, which enables an user to uncover different natural emollient mixtures, as replacement solutions to synthetic market benchmarks. This tool will significantly cut formulation costs by providing knowledge-based solutions to formulators (Fig. 8).

## Keynote: Cosmetics 360 Degrees

Birgit Huber  
(Industrieverband Körperpflege- und Waschmittel e.V.)

In the EU, there has been uniform legislation for cosmetic products since 1976 with strict requirements for the safety of the products to human health. This legislation has undergone many changes since then and today the standard for cosmetic safety in the EU is higher than anywhere else in the world. A robust definition and comprehensive documentation – especially the safety assessment – are two examples. In recent years, other legislations have also increasingly influenced the cosmetics regulation, e.g. the regulations for nanomaterials or the chemical legislation keyword CMR substances. The European Chemicals Strategy within the framework of the “Green Deal”, which aims to further harmonize the assessment of chemicals in the EU, is currently presenting the cosmetics industry with further far-reaching challenges. This means that the European Cosmetics Regulation published in 2009 is also facing its first “major revision” (Fig. 13).

### Cosmetics 360 Degrees

- Cosmetic products are comprehensively regulated in the European Union
- Cosmetic products are safe for use by consumer and professionals
- Cosmetics are essential for consumers in their every day's life
- Cosmetics protect the skin, hair and teeth
- Consumers want to get to know a lot of information about cosmetic products and their ingredients
- The ingredient database from the COSMILE-App ([www.cosmile.app](http://www.cosmile.app)) has answers to these questions. The COSMILE-App is part of the sustainability journey which the majority of cosmetic companies has already started.

Fig. 13 Cosmetics 360 Degrees (Source: Mrs Birgit Huber, Industrieverband Körperpflege- und Waschmittel e.V.)

  
DEUTSCHE GESELLSCHAFT  
DER PARFÜMEURE  
im  
SEPAWA® e.V.

## German Association of Perfumers in SEPAWA® e.V.

### Scientific Conference – Fragrance and Fragrance Lounge

From October 26 – 28, 2022, the DGP was again represented at the SEPAWA® CONGRESS with its Fragrance Lounge and a lecture morning on fragrance topics.

The theme of the Fragrance Lounge this time was “A Fragrance Journey through Time”. SEPAWA® had invited fragrance houses to participate in a competition in which fragrances for the time periods 20s/30s, 50s/60s and 80s/90s as well as for the future could be submitted. A jury of DGP fragrance experts had judged the entries, and selected a winning fragrance for each time period.

On Wednesday afternoon, the respective perfumers personally and very entertainingly presented their creations to an interested audience in the Fragrance Lounge. The event was moderated by Dr. Edison Diaz.

The winners were:

- 20s/30s: “Roaring Twenties” by Marie Brunet, Düllberg Konzentra
- 50s/60s: “Teds and Riots” by Fred Naraschkéwitz, Frey and Lau
- 80s/90s: “Wham” by Marc Daniel Heimgartner and Daniela Marty, Luzi



Picture from l. t. r.: Dr. Edison Diaz with Marie Brunet, Fred Naraschkéwitz, Marc Daniel Heimgartner and Marcus Betzer (Source: Edison Diaz)



Picture: Sponsorship Award Winner Akshita Joshi and Edison Diaz (Source: Edison Diaz)

• Future: “Kreuzberg” by Marcus Betzer, Symrise AG  
4000 winning fragrances were distributed as roll-ons with accompanying information in the Fragrance Lounge.

The Fragrance Sessions on Thursday featured five presentations focusing on the sustainability and naturalness of fragrances and the physiological and emotional response to fragrances.

This year’s winner of the DGP sponsorship award **Akshita Joshi** (Technical University of Dresden) kicked off with her contribution on **“Neural Associations Between Well-being and Odor Perception”**.

Using functional magnetic resonance imaging (fMRI), Ms. Joshi examined the activities of different brain regions during the perception of scents that subjects had associated in pretests as strong (vanilla, fine soap) or weak (bed sheets, coffee) with well-being. Scents with and without associations to Well-being activate different regions in the brain. Well-being scents activate the olfactory brain as well as emotional and cognitive ar-

reas. Especially the angular gyrus, a brain region in which different sensory impressions are integrated, plays an important role. This area is particularly activated when people who are currently not feeling well are stimulated with well-being associated scents. The research results underline that scents can play an important role in mood enhancement or changes in emotional state in people.

The physical response to scents was also addressed by **Aureli Soria Frisch** (Starlab Barcelona S.L.) in his presentation **“Emotional Response to Odours from Brain and Peripheral Signals.”**

In Russel’s Circumplex Model, emotions are classified according to the degree of activation (high vs. low) and the degree of liking (unpleasant vs. pleasant) in a circular model. Aureli Soria Frisch showed that a very well validated method exists to represent the emotional state of a person in the Circumplex model from the measurement of brain waves (EEG), heart rate (ECG) and electrodermal activity (GSR). This method was also applied to the response to scents. 27 subjects were played two stimulat-

ing, two relaxing and two neutral scents. The evaluation of the physiological responses agreed well with the predicted states in the circumplex model.

**Ana Ripoll Santos** (Iberchem), in her presentation **“Sustainable Fragrances: is Natural the Answer?”** considered the necessities in developing fragrances that are to be advertised as natural or organic or receive certain certifications such as COSMOS. Due to the severe restrictions on possible ingredients for various claims, specific briefing and close cooperation with clients is critical for perfumers.

Many consumers believe that the use of natural ingredients equates to product safety. For fragrances, however, this can be a misconception. Also, broader aspects such as resource consumption or fairness of working conditions are not covered by the term “naturalness.” For this reason, Ana Ripoll Santos made a committed plea for a more comprehensive view of fragrance sustainability.

The definitions, international guidelines and certifications for natural fragrances were also presented by **Rola Mahboub** (CellMark) in her talk **“My Perfume is 100% Natural. But What Does That Mean? What Exactly Does it Contain?”**.

Certificates such as Natrue, COSMOS or the ISO standards for natural or organic fragrances provide the framework of possible ingredients. IFRA has now also listed 992 Natural Complex Substances (NCS), which are obtained by extraction from plants, in its latest transparency list. In cosmetic applications, however, the use of NCS is challenging because of the variability of their composition. This can affect the stability of both the fragrance and the product. CellMark France has started a research program to evaluate natural fragrances in terms of their stability in different cosmetic formulations.

**Charlotte Tournier** (Odournet France – Sensenet) demonstrated methods for olfactive consumer testing in the presentation **“Naturalness and Impact on Olfactive Sensoriality”**. Consumers like to choose “natural” products, but at the same time do not want to sacrifice performance or familiar good fra-



grance. Four case studies were used to demonstrate how products were tested for continued consumer acceptance after switching to natural ingredients or fragrances. For this purpose, Sensenet uses trained evaluators who determine the intensity or characteristics of fragrances using standardized methods. Instrumental analytical methods based on gas chromatography/mass spectrometry are also available.

During the congress, members of the DGP Board and Advisory Board provided further explanations on various fragrance topics in the Fragrance Lounge and addressed the questions of interested visitors in the context of individual fragrance training sessions. This offer was very well received.

The traditional champagne reception of the DGP for its members on Thursday afternoon offered plenty of opportunity for exchange, reunion and lively conversation.

All in all, a busy and very successful congress for the DGP in SEPAWA® e.V. A big thank you goes to the whole organization team, and especially to Nancy Snehotta for the perfect preparation and setup of the Fragrance Lounge!

## Forum for Innovation – Personal Care

### New Natural Biopolymer Line in Personal Care!

Natalia Chudinova  
(BASF Personal Care and Nutrition GmbH)

Today consumers are becoming increasingly empowered looking for more transparency and ask even more proven sustainability in their products. At the same time demand for sustainable biopolymers is constantly rising. The Verdessence™ portfolio of natural biopolymers, designed to help create even the most demanding cosmetic. This star lineup of biopolymers supports manufacturers in creating sustainable products in all personal care application fields, including shampoo, body wash, creams and lotions, hair styling products, and many more. Attractive sensory and high performance are key to our ingredients. Our formulation experience will help manufacturers to ensure that they will not have to compromise on performance. All ingredients in this portfolio are made from natural and renewable feedstocks and can be used to design natural and organic cosmetics.

### Astaxanthin – the Red Diamond Amongst Antioxidants

DI Katharina Müller  
(BDI-BioLife Science GmbH)

The skin is exposed to sunlight on daily basis and needs support in its function as protective shield. The natural carotenoid astaxanthin from the microalgae *Haematococcus pluvialis* is considered the most powerful antioxidant and neutralizes harmful free radicals. In its functionality, it is highly effective against the impacts of UV-radiation. BDI-BioLife Science GmbH has proven these biological protection benefits with own human clinical studies with its branded active ingredient AstaCos® OL50 in the field of topical application. Unlike other antioxidants, astaxanthin does not become a pro-oxidant and is therefore called the “red diamond of radical scavengers” (Fig. 5).



**AstaCos® OL50 – The RED DIAMOND amongst antioxidants**



**Claims:**

- Outstanding antioxidative effect
- Strong anti-ageing properties
- Increases skin hydration and firmness
- Improves biological cell protection
- Instant & healthy glow
- Blue light protection against digital ageing




**Fig. 5** AstaCosOL50 The RED DIAMOND  
(Source: DI Katharina Müller, BDI-BioLife Science GmbH)



## New Pure Zinc Oxide UV Filters in API Quality for Cosmetic and OTC Sunscreens

Alexander Kielbassa  
(Merck KGaA)

Consumer demand for clean, more eco-friendly and all-mineral sunscreens is driving the popularity of Titanium Dioxide and Zinc Oxide. Both are approved mineral UV filters in EU and globally. We introduce two new high-purity Zinc Oxide UV filter grades in API quality. Eusolex Z-BASE is a basic UV filter grade including OTC use, whereas Eusolex Z-TEC is an optimized Pharma (OTC) quality offering highest transparency on skin. Both grades meet or exceed the requirements of current pharmacopoeia, are Kosher, Halal-certified and COSMOS approved. Eusolex Z-BASE is a pure and uncoated microfine Zinc Oxide with rod-like shape crystal clusters, an effective broad-spectrum UV filter with excellently balanced absorbance in UVA & UVB range. Eusolex Z-TEC is also a high-purity uncoated microfine Zinc Oxide, with isometric crystal shape, offering highly effective broad-spectrum UVB & UVA protection and enabling sunscreens with highest transparency on skin. The two new Zinc Oxide UV filter qualities can be used for any type of cosmetic and OTC sunscreen applications, emulsions, creams, fluids, foundations, moisturizers etc. In our introduction we cover the current regulatory situation, how to best disperse and formulate Zinc Oxide UV filters, their compatibility and performance.

## Biocide Booster Based on Combination of Alkylpolyglucosides and Glycine Betaine Ester

PhD Boris Estrine  
(WHEATOLEO)

Nowadays, the preservative substances are very controversial, more and more restricted due to their skin irritating and sensitizing potential. The formulators are looking for other alternative products to preservation. We have developed a new surfactant combination displaying biocide booster properties, efficient cleansing, wetting, solubilizing, foam boosting and stabilizing properties. It allows design of risk-free cleaning formulations. Derived from natural, sustainable resources such as sugar beet wastes, and highly biodegradable, this surfactant composition shows a low ecotoxicity profile and low to no skin irritation. Thanks to its high-water solubility and its various functionalities, it offers formulators a broad range of formulation flexibility by using a single ingredient to ensure a safe preservation. Because of its cationic part, it also delivers conditioning effects on skin and hair to improve sensorial benefits of formulas. It can be easily used in rinse-off personal care applications such as 2 in 1 conditioning shampoo, hair repairing.

## Sophorolipids: Natural and Eco-friendly Biosurfactants – EcoSense™ GL-60 HA Surfactant and EcoSense™ GL-60 HL Surfactant

Ingrid Vervier (DOW)

Customer demand for sustainable, non-sulfate based and gentle cleansing trend is increasing, and global brand owners are implementing sustainable practices aiming to reduce carbon footprint. These trends have led to increased interest in biosurfactants with low carbon footprint and that can deliver the performances in personal care rinse-off and leave-on applications. Dow is excited to launch 2 glycolipids, more specifically sophorolipids materials: EcoSense™ GL-60 HL Surfactant and EcoSense™ GL-60 HA Surfactant. Those are naturally derived biosurfactants with emulsifying properties. Dow sophorolipids are sugar based, 100% renewable materials, readily biodegradable, made from low carbon footprint process, and offer mildness with low aquatic toxicity. Dow is launching biosurfactants to help brand owners meet the sustainability and performance goals for their formulations.

## Preservation of Cosmetic Products with Barrier Technology

Caroline Marlier  
(Gustav Grolman GmbH & Co. KG)

Due to the nature of their composition and the conditions in which they are used, many cosmetic products are vulnerable to the intrusion of microorganisms and may even break down when contamination develops. Therefore, preservatives for cosmetics must be able to inhibit the unwanted microbial growth that can occur inside the container before the preferred use date, while it remains closed, and once it's been opened. They must avoid the development of contamination through the entire life cycle of the cosmetic product. Furthermore, like all cosmetic ingredients, preservatives must be safe when they come into contact with the skin. For the preservation system to achieve its protective function, its selection process must be based on a previous risk analysis of the contamination potential. This level can be determined by using a matrix to evaluate the microbiological risk for all parameters that most favour the growth of microorganisms:

- The free water content in the formula
- The content of nutrients in the form of organic matter and microelements
- The temperature, pH, and oxygen content.

Based on the risk indicated by the matrix, a specific preservation strategy can be applied. This can be achieved by selecting preservatives themselves formulated with optimal combinations of different substances that have an inhibitory action on the contamination, as well as ingredients with anti-microbial activity and efficacy enhancers. The composition of these new preservation systems is balanced in such a way that it represents a barrier to the development of microorganisms in the cosmetic product formulation itself. It will also reduce the toxicity of the finished cosmetic product by reducing the use of traditional preservatives.

## Correlation of Interfacial Elasticity and Emulsion Stability

Julia Robbert  
(KRÜSS GmbH)

Emulsions are essential for the personal care sector. Their stability, an important factor for formulators, is mainly influenced by aggregation with subsequent coalescence of the droplets. To reduce the tendency to coalesce, and thus increase emulsion stability, highly elastic interfaces have proven useful. To create these, block copolymers or mixtures of surfactants with high and low HLB values are used in practice. The “oscillating drop” method can be used to experimentally determine the interfacial elasticity and thus better understand the formation of such interfaces and the influence of different surfactants. Due to recent advancements of the experimental methodology, these measured values are now much faster, easier, and more readily accessible than was the case just a few years ago. The basics of the measurement method, as well as the latest available measurement equipment, will be presented first-hand by the manufacturer. Of particular interest for industrial practice are possible correlations between interfacial rheological measured values and the stability of emulsions, which can be used to make predictions about stability and to optimize formulations in a targeted manner. There are already some promising examples of this in the literature, which will be presented and discussed together with our own measurement data. For this purpose, mixtures of the typical commercially used surfactants TWEEN 80 and SPAN 80 with HLB values between 4.3 and 15

were prepared and their stability investigated using LumiFuge (LUM GmbH). A very good correlation of the creaming rate and interfacial elasticity was observed. The oscillating drop method thus shows its potential as a fast-screening method to identify the most promising formulations and provides physical parameters which can be used specifically for the optimization of emulsions (Fig. 9).

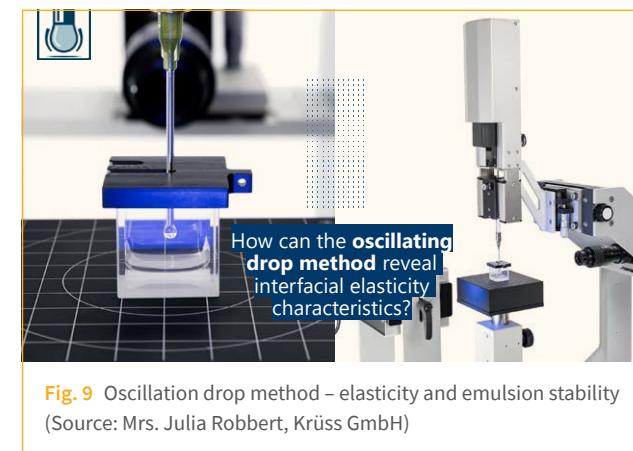


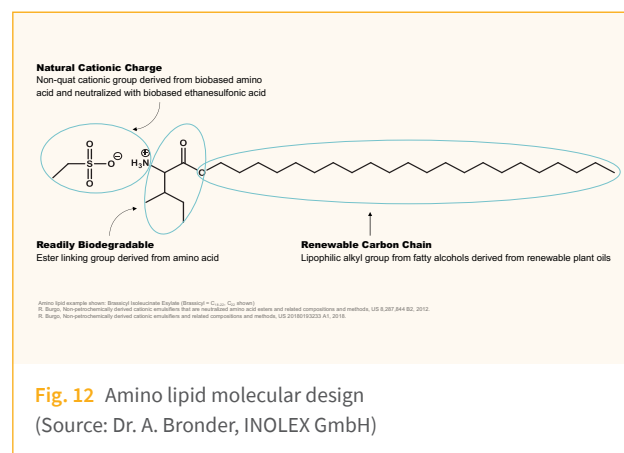
Fig. 9 Oscillation drop method – elasticity and emulsion stability  
(Source: Mrs. Julia Robbert, Krüss GmbH)

## Plant-based Conditioning for Truly Sustainable, High-performance Hair Care

Dr. Anna Bronder  
(INOLEX GmbH)

Consumers are asking for sustainable & safe formulations without sacrificing performance. Whether formulated for luscious locks, cute curls, or tamed tresses, hair care products must perform. Different hair types and climates are only two of the many factors to be considered. Traditionally, hair care uses quaternary ammonium compounds (Quats) and silicones to create high-performance formulations. Due to consumer concern, regulation changes, and the rise of free-from claims, it is increasingly important to choose alternatives with better environmental, social, and governance profiles. Natural and plant-based claims are often associated with Safety and Sustainability. However, these claims are only one part of truly sustainable formulations. Feedstock selection, reactions and manufacturing processes, as well as molecule degradation have to be considered to ensure reduced hidden trade-offs. We demonstrated plant-based amidoamines and amino lipids to be functionally comparable to Quats. They increase sustainability and mildness of formulations as they are biodegradable, non-toxic to aquatic life, and pose no irritation potential to skin and eyes. Compared to traditional ingredients, they help save energy and reduce greenhouse gas emissions. Providing additional functional

benefits to formulations, they can be used to create high-performance sustainable hair care with fewer ingredients in modern product formats. With their non-quat cationic charge, plant-based amidoamines and amino lipids offer a truly sustainable and functional answer (Fig. 12).



**Fig. 12** Amino lipid molecular design  
(Source: Dr. A. Bronder, INOLEX GmbH)

## Advanced Foam Structure Analysis – a Road to Efficient Foam Testing

Martin Hoffmann, SITA Messtechnik GmbH

Foam plays an essential role in the application of a wide variety of surfactant-containing liquids and is thus also a decisive factor in research and development as well as in quality assurance. The challenge for an effective assessment of the foaming behaviour is the reproducible foam generation, which additionally produces a foam that should be comparable to the one from the application. However, since foaming is largely dependent on boundary conditions such as energy input, temperature, concentration, etc., a metrological implementation must take these into account and keep them variable. In addition, a simple screening of the test and sample parameters facilitates an optimisation of these, with the aim of producing desired foam properties and distinguishing between different products and compositions. In addition to the foam volume, the foam structure is particularly characteristic of the foam for an overall evaluation of the foam produced. It can additionally provide a link to the haptic properties that are important for cosmetic products. However, the evaluation of the foam structure, i.e. the spatial distribution of the bubbles and geometry, represents a considerable effort in the evaluation and presentation of the different foams. A reduction of the series of structural images to meaningful parameters or foam properties is essential for an efficient foam analysis. In this work it is shown on the example of different shampoos how new foam parameters can be generated by a suitable evaluation of the height- and time-dependent structural properties. This enables an efficient comparison of different samples and their dependence on different boundary conditions.



### New Sophorolipids for Home Care Applications

Dr. Christoph Groß-Heitfeld  
(Sasol Germany GmbH)

Sophorolipids are the next step of innovative and sustainable products for Home Care applications and beyond. A world that strives for dramatic reduction of GHG emissions needs surfactants which are sustainably sourced and show low CO<sub>2</sub>-footprints. But is there more – what about performance? Where are the challenges and opportunities within this class of products now and in the future? Two new Sophorolipids which have been developed for high-foaming and/or cleaning purposes will be presented. These will be commercially available in 2023.

### Sustainable Manufacturing of Biosurfactants: Sophorolipids

Dr. Vicky De Groof  
(Holiferm)

The commercial interest in biosurfactants is rising rapidly. Major formulators have made strong commitments to expand their green, bio-based product portfolio while eliminating petrochemicals. Biosurfactants are a sustainable replacement for petrochemical-derived surfactants. They also show more favourable characteristics for use in personal care, home care and agriculture, such as their mildness, moisturizing properties, and biodegradability. However, high production costs via traditional batch processes are hindering biosurfactants to become economically viable across the full market range. We present our innovative technology and the assessments we carried out to proof it is an economical and environmental improvement, key to meaningfully building a sustainable surfactant industry. Using interdisciplinary research, we created and scaled up a cheaper, but also a more sustainable production method for sophorolipids known under the assigned INCI name of “Candida Bombicola/Glucose/Rapeseed Oil Ferment Ex-

tract”. Our patented integrated fermentation and gravity-based separation technique increases productivity of sophorolipids to >5.5 g l<sup>-1</sup> h<sup>-1</sup> and titer to > 1000 g l<sup>-1</sup>, thus dramatically reducing production costs. A life cycle assessment shows a circa 1.5 tonne reduction in CO<sub>2</sub> Global Warming Potential (GWP) per tonne active product compared to petrochemical surfactants. The process uses >50% less energy in comparison to traditional sophorolipid processes. The LCA indicated raw materials were the main contributor to total GWP (>70%), thus, highlighting the next step forward to improve process sustainability, e.g., investigating alternative feedstock such as industry by-products or waste streams. Biodegradability assessments (OECD 301B) confirmed that sophorolipids are readily biodegradable in a natural, non-storage, environment. By using an in-vitro test the mildness of sophorolipids was confirmed as a non-irritant mild on skin up to 48 hours after application.

## Enzymatic Spray Hand Dishwash: More Powerful, More Profitable

Morten Risgaard Larsen (Novozymes)

The Hand dishwash category has experienced increasing commoditization and margin decrease. This change has happened primarily due to three main drivers: Increasing amount of product launches has created a crowded marketplace competing for shelf-space. Lack of differentiation in both product perception and performance makes it difficult to keep consumers loyal to your brand and hence creates significant churn and price erosion. Production cost have gone up in recent years due to both Covid and global supply chain restraints. At the same time, consumers are looking for powerful products. Keeping performance high and cost low is more difficult than ever. So how do you balance increased competition, lack of consumer perceived differentiation and increasing production cost in a price sensitive market? To gain an edge in the market, focus on what really matters: Product should be better (more effective on stains and more convenient to use). Product should be more “likeable” (focus on the claims that resonate with consumers). Products

should be more profitable (both focusing on higher price points and lower production cost). Sprays have already proven to be a “gamechanger” in the HDW-category. Products are realizing both significantly higher consumer ratings and price-points compared to other HDW-formats. More Powerful, More profitable: Building on this momentum, the next generation of HDW-Sprays are entering the global market. The category frontrunners leverage enzymes and are delivering superior solutions. Novozymes enzymatic portfolio introduce solutions bridging many of the market challenges we see today. We have identified the best possible enzymes to assist you in bringing the newest technological breakthroughs. New synergistic effects of surfactants and lipase show significantly better grease cutting and removal at a cost-neutral price-point. This supports you in keeping your consumers needs and preferences front-and-center, while delivering products that are both better suited for out-competing competition and growing your bottom-line.

## Together for a Clean Sweep

Stefanie Medlin  
(Zschimmer & Schwarz GmbH & Co KG)

Zschimmer & Schwarz is a global supplier of chemical auxiliaries and specialties headquartered in Lahnstein near Koblenz, Germany. The family business was founded in Chemnitz in 1894 and is positioned across industries with nine different business divisions. The Cleaning Specialties Division offers an extensive portfolio of formulation components for manufacturers of cleaning and care products for household, industrial and commercial use as well as vehicle cleaning products. The combination of surfactants, polymers and phosphonates meets the most diverse requirements related to both the cleaning and care of the cleaned surfaces. Tailor-made solutions cater to most additional environmental and commercial requirements. Furthermore, the application technology laboratories at the various locations of the Zschimmer & Schwarz Group provide expert support for the development of innovative formulations. The focus of this presentation will be a selection of innovative application ideas using the synergistic effects of our technologies: a floor care polymer which improves the performance of glass cleaners with anti-fogging effect, a complexing agent which increases the solubility of nonionic surfactants in alkaline cleaners, and a natural surfactant which enhances the handling of highly concentrated cleaners.

## Formulators' Nightmare: Keep Innovating with Fewer Products!

Aliya Defrates-Penelon  
(Kuraray Europe GmbH)

Today more than ever formulators of the household industry are struggling as they are torn between two trends. On one hand the market is looking for innovations and improved performances of the household cleaning products and on the other hand development of new products is very limited due to several factors such as the increasing cost of registrations (REACH, UK REACH, KKDIK, Eurasia REACH, ...), the cost of new molecule development or the restriction of usage of some chemicals. Some companies also request their formulators to limit the number of ingredients used which is an additional constraint to create new formulations. The possibilities being more and more limited, it becomes crucial to have access to multifunctional ingredients that can bring more than one benefit to the broad range of household products but various advantages to the broad range of household products formulators are asked to create. Kuraray's solution is MMB (3-Methoxy-3-Methyl-1-Butanol). MMB is a multi-purpose ingredient, registered worldwide, safe for humans and for the environment. This specialty solvent can be used in all types of household products such as air care products, window cleaners, oven cleaners, carpet cleaners, laundry detergents, bathroom cleaners, ... MMB has many benefits to offer: degreasing properties can be improved with a better cost in use, the amount of surfactant can be reduced, transparent formulations can be obtained, flash points can be increased as well as cloud points, enzyme's activity can be less impacted, ... MMB is really one ingredient you can use to bring innovation and efficiency to all of your products!

## Sustainable Packaging

### The Werner & Mertz Recyclate Initiative – Sustainability in Packaging for Home and Personal Care

Immo Sander (Werner & Mertz GmbH)

The Werner & Mertz Recyclate-Initiative is the pioneering umbrella project for sustainable packaging concepts for home and personal care products. Started more than 10 years ago the foundation was built by consequent usage of recycled plastic materials. Believing in the Cradle-to-Cradle® product design for end consumer products Werner & Mertz supported the circularity principle by application of almost unused waste streams especially plastics from household waste collection. Many fundamental projects derived from this idea. Around the application of recycled plastics Werner & Mertz took care of the quality of mechanical recycled plastic itself. Therefore, different industrial and university development cooperations are established on the so-called innovation platform for material sciences (polymers, additives), printing inks, adhesives and recycling processes.

## Forum for Innovation – Sustainability

### Addressing Sustainability with Waterless Formats in Consumer Products

Mireia Collado  
(Kao Chemicals Europe)

More than ever, consumers are tapping into eco-friendly claims when looking at daily goods such as detergent and cosmetic products. Additionally, waste-free lifestyles are becoming more and more popular among consumers, who place special emphasis on replacing single-use plastics by refillable options. In line with the current market trend, there is also a European call for a commitment to sustainability, which further reinforces the necessity of innovative eco-friendly products that meet the European Green Deal objectives. To meet with the demands of society, the Home and Personal Care industry is being challenged to move towards more sustainable formulations, showcasing an amazing variety of innovative formats, starting from dilutable super-concentrated compositions and ending with totally water-free alternatives that cut back on single-use plastics and water transportation. However, the main challenge is to ensure the efficacy of sustainable formats and ingredients. Consequently, at Kao, we have concentrated our efforts on designing surfactant products that facilitate the formulation of these emerging challenging compositions. Being key active ingredients in the present formulations, our selected surfactants not only enable our customers to be aligned with today's sustainable concern, but also to provide the functional value that consumers are looking for. This lecture aims to share the best of our technical knowledge about innovative waterless formulations. As a whole, this project aims to present how sustainable waterless formats can be formulated selecting key ingredients to produce convenient products, which offer good performance and are environmentally friendly at the same time.

## A Majority Biobased Surfactant Blend That is Easy to Formulate and Outperforms Standard Surfactants

Josmary Valesquez (Nouryon)

Household consumers are increasingly looking for more sustainable cleaning solutions. Sustainability can take many forms in this regard, whether it's about biobased materials, biodegradability, (micro)plastics reductions, life cycle analysis's or reducing CO<sub>2</sub> emissions. Furthermore, consumers require high performance and cost competitive solutions. Surfactants play an important role in hard surface cleaning and we see exciting innovations in this space. Utilizing our R&D and manufacturing capabilities, we have crafted a majority bio-based and high-performance blend that provides formulators with manufacturing simplicity, which delights the downstream consumer and pro-

vides sustainable hard surface cleaning. The product achieves the highest level of consumer requirements by: • Exceptional performance-in-use for hard surface cleaning • Delivered in a not classified formulation • Is quat-free • EU and Nordic Eco-label compliant • Majority biobased of vegetable origin (RSPO MB). As well as providing unique consumer benefits, the product also provides formulators with numerous advantages: • Optimized blend for maximized cleaning and degreasing performance • Only cleaning component needed in HSC formulary • Nonionic surfactant blend that is compatible with all other type of surfactants • High activity, product to minimize pack-

aging and reduce transport costs • Mobile liquid to freezing and below • Suitable for use in a broad range of pH (4-11) • Low viscosity for easy pumping and handling • Rapid dissolution when formulating even at low temperatures • Good temporary foaming which can be supplemented through formulation • Crystal clear, low color product for formulation aesthetics. We believe this product is the latest innovation that the markets needs to achieve the sustainability goals whilst delivering exceptional performance in hard surface cleaning for households.

## After Event

**A popular tradition. More than 900 participants eagerly awaited the After Event at the end of the 2<sup>nd</sup> day of the congress.**

Star chefs created delicacies of the most diverse kind – there was something special for every taste. The brief waiting times at the 11 food stations were gladly accepted. Accompanied by the band of the Estrel Hotel, the sporting action continued, sometimes louder, sometimes more mellow but with a lot of verve on the packed dance floor. As usual, the party went on until well after midnight.





## Summary, Thanks and Outlook

It has certainly become clear that the annual SEPAWA® CONGRESS is the most important meeting place for the detergent / cleaning agent, cosmetics and perfumery industry in Europe.

The Executive Board of SEPAWA® e.V. would like to thank everyone who contributed to the success of the 69<sup>th</sup> SEPAWA® CONGRESS. Special thanks go to the speakers on different topics during the various sessions. With their creative stands, the exhibiting companies provided the framework for the evolved trade exhibition with more than 300 exhibitors. It was above all the 3,175 congress participants who ensured a lively atmosphere at the Estrel Congress Center.

The interest in the lectures has increased pleasingly, simply due to the number of lectures submitted. Demands placed on the quality of the content and the thematic breadth of the lectures remained and was also guaranteed by the active participation of the GDCh Division of Detergent Chemistry during the EDC and the DGK during the CSC. Thematically, the keyword “sustainability” ran through almost all lectures, regardless of whether they represented fundamental scientific or application-focused content. Particularly noticeable was the search for natural, sustainable active ingredients in personal care and cosmetic applications, but also the use of biosurfactants, specifically sophorose and rhamnose lipids, as an alternative to classic surfactants. New, refined measurement techniques for surfactant-related substance data were also the subject of several presentations.

The 69<sup>th</sup> SEPAWA® CONGRESS was a success. From today's perspective, there seems to be no need to change the congress location, and it has already been announced for coming years. Special thanks go to the team behind Robert Fischer of the newly founded SEPAWA® eVent GmbH, which as a 100% subsidiary represents the interests of SEPAWA® e.V. in an outstanding way. You don't organise a congress of these dimensions “off the cuff”. It takes a high degree of experience and enthusiasm. It's not copying successful past congresses that makes the difference. The main thing is also to tackle new topics such as “packaging”.

Of course, preparations for the 70<sup>th</sup> SEPAWA® CONGRESS are already under way.

Yours too?



25–27 OCTOBER 2023

# SEPAWA<sup>®</sup> CONGRESS

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**Imprint:** SEPAWA<sup>®</sup> eVent GmbH, Dorfstrasse 40, 86470 Thannhausen, Germany

**Author Congress Report:** Dr. H. Lothar Möhle, Oberhausenstr. 23, 8907 Wettswil a.A., Switzerland

**Authors DGP Report:** Dr. Edison Diaz, Dr. Anneliese Wilsch-Irrgang (Chairs of the DGP)

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