NINTH EUROPEAN DETERGENTS CONFERENCE REPORT

Hermann G. Hauthal

Emulsions and Dispersions, Trends in Detergency, Cleaning and Hygiene, Sustainability and Product Safety, Forum for Innovations

For the fourth time, Fulda was the venue of the 60th SEPAWA Congress in conjunction with the 9th European Detergents Conference. 197 exhibitors came to Fulda. By extension of the exhibition area the number of booths increased to 207 (2012: 187). The famous baroque city of Fulda drew 2,166 participants, 12 % more than 2012. For the first time, the number of 2,000 was clearly broken. Forty-one countries were represented (2012: 40).

The focus of this year's European Detergents Conference (EDC) with ten Lectures and eight Posters was on *Emulsions and Dispersions – Fundamental, Formation and Application*. The SEPAWA *Detergents and Cleansers* Sessions: *Trends in Detergency* and *Cleaning and Hygiene,* and the Session *Sustainability* and *Product Safety,* jointly organised by the German Chemical Society (GDCh/HAD) and the SEPAWA Expert Group Legislation – Environment – Consumer (LUV), presented 15 Lectures. For the fourth time, the German Society for Scientific and Applied Cosmetics (DGK) organised in cooperation with the SEPAWA Group Applied Cosmetics two Sessions on *Anti-aging* and *Sensory Properties* (together ten Lectures). The SEPAWA Forum for Innovations presented 66 Short Lectures in the field of detergents and cosmetics, nearly the same number as in the previous year. The German Society of Perfumers focused on *Creativity and Emotionality*. Beside SEPAWA Prizes the Young Researcher Prize of the GDCh Division of Detergency and Formulations was awarded. This Division also sponsored Poster Prizes.

This year's Formal Address "Heart Detergents – How the Ten Commandments Can Cleanse the Mind for Real Success" was hold by the Capuchin monk *Brother Paulus*. In his Marketing Lecture *Michael Bartl* focused on "Open Innovation: The Transformation of Innovation Models in the Digital Age".

In his opening remarks the Member of the Board of the SEPAWA e.V., Dr. *H. Lothar Möhle*, stressed that the "main points of development in our sectors continue to be oriented on the topics of sustainability, convenience and wellness. Intelligent use of available raw material resources, substitution of petroleum-based raw materials with renewable raw materials and the wishes of consumers for 'green', but at the same time high-performance, products continue to be focal points. The demand for ever better, innovative products against the background of worldwide increases in the price of raw materials is a great challenge to us all. In this situation, companies must constantly prove their ability to grow successfully even in economically challenging times.

This year, for the first time outstanding innovations in the fields of cosmetics, washing/cleaning agents and perfumery will be awarded with a total of three innovation prizes. Innovations are the key to more growth and competitiveness, and thus a strong pillar of our business."

Macro-, Mini-, Micro- and Nanoemulsions

To elucidate the diversity of "emulsions" *Cosima Stubenrauch*, University Stuttgart, Germany, started this year's

Dr. *H. Lothar Möhle*, Member of the SEPAWA Board
(Photo: www.katrinheyer.de)

EDC program answering the question "Macro-, Mini-, Micro- and Nanoemulsions: Who is Who?" In literature the terminology is very often not used correctly which leads to a lot of – unnecessary – confusion and misunderstandings. In this presentation clear definitions of the different emulsions were given. It was shown that the key parameters one has to look at in order to classify an emulsion are the appearance, the droplet size, the stability, the surfactant concentration and the way it is generated.

Since many years the definition, formation, characterisation and a lot of applications of "normal" emulsions ("macro-emulsions") and of microemulsions are well known. Emulsions are turbid, thermodynamically unstable mixtures of at least three components (H_2O – oil – surfactant) with micrometer-sized oil or water droplets (dispersed phase) in H_2O or oil (continuous phase) and are generated by agitation of the components or by phase inversion. A widespread application of emulsions is emulsion polymerisation. Microemulsions are transparent, thermodynamically stable mixtures of at least three components (H_2O – oil – surfactant) with various nanostructures and ultra-low interfacial tension (10^{-6} N m^{-1}) and form spontaneously after mixing. An example for the application of microemulsions is the preparation of nanoparticles.

PIT emulsions and miniemulsions fill the gap between these two types of emulsions. PIT emulsions are bluish, thermodynamically unstable mixtures of at least three components (H_2O – oil – surfactant) with nanometer-sized oil or water droplets (dispersed phase) in H_2O or oil (continuous phase). If not all at least part of the surfactant must be a non-ionic C_iE_j. Applications of PIT emulsions can be found in personal care (sprayable sun screens, body lotions, deodorants). Miniemulsions are bluish, thermodynamically unstable mixtures of at least four components (H_2O+salt – oil – surfactant or H_2O – oil+hydrophobe – surfactant) with nanometer-sized oil or water droplets (dispersed phase) in H_2O or oil (continuous phase). The droplets have similar size as those of PIT emulsions but they are generated differently and have less broad size distribution. Generating a miniemulsion is shown in Fig. 1. An important application can be found in the encapsulation *via* polymerisation (Fig. 2). A summary is given in Fig. 3. Macro-, mini-, micro- and nanoemulsions are used in very different areas ranging from specialized to large scale applications. In the future emulsions promise a plethora of innovations.

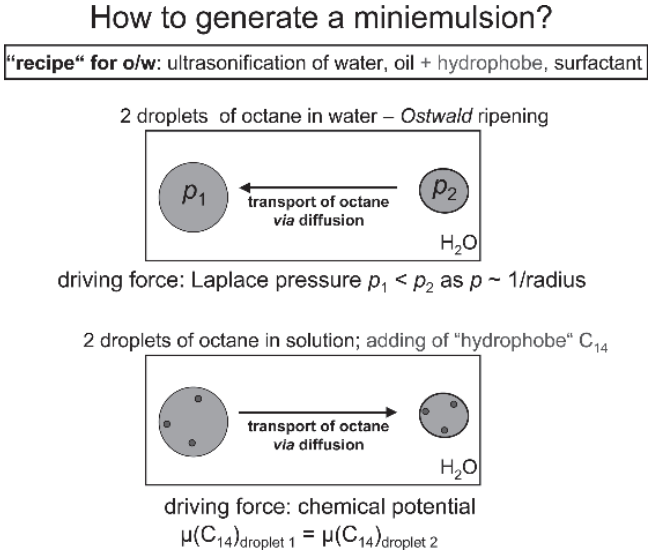
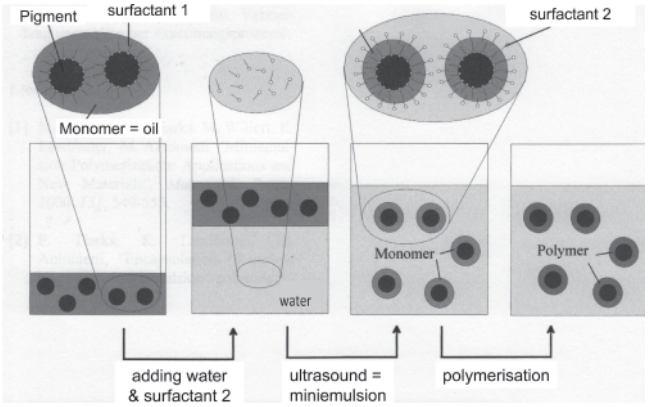


Figure 1 Generating a miniemulsion (*Source: Cosima Stubenrauch*, University of Stuttgart)

Nanoemulsions, Templates for Polymers, Nanoparticles

Conxita Solans, Consejo Superior de Investigaciones Cientificas (CSIC), Barcelona, Spain, presented "Emulsification & Generation of Nanoemulsions by Low Energy Methods". The formation of kinetically stable liquid/liquid dispersions in the nanometer range is of great interest from fundamental and applied viewpoints and can be achieved either applying external energy to the system (dispersion or high-energy methods) or using the internal chemical energy of the components (condensation or low-energy methods). Among the latter, the so-called phase inversion methods are particularly interesting as they make use of the chemical energy released through phase transitions that take place during the emulsification process. Surfactant molecular assemblies with zero average curvature such as lamellar liquid crystals or bicontinuous microemulsions have been shown to play a decisive role in the formation of emulsions with minimum droplet size by phase inversion low-energy emulsification methods. In this presentation the relationship between surfactant molecular structures and the properties of nanoemulsions have been described.

"Particle-stabilized Emulsions" were proposed by *B.P. Brinks*, University of Hull, U.K. Colloidal particles may ad-



http://www.maschinenbau.tu-ilmenau.de/mb/wwwtd/hydromag/ferro/conferences/workshops/benediktbeuern/pdfs/hoffmann.pdf

Figure 2 Application of miniemulsions: Encapsulation via polymerisation (*Source: M. Antonietti*, Max Planck Institute of Colloids and Interfaces)

	Emulsion	Micro-emulsion	PIT emulsion	Mini-emulsion
Appearance	white	transparent	bluish	bluish
Droplet size	> 1 µm	5 – 50 nm	50 – 200 nm	50 – 200 nm
Stability	-	+++++	+	++
Surfactant concentration, wt.-%	< 1	often > 10	5 – 10 *	5 – 10 #
Generation	strong influence of process	no influence of process	strong influence of process	strong influence of process

* nonionic C_iE_j required

\# addition of hydrophobe (o/w) or salt (w/o) required

Figure 3 Who is who? The emulsion types (*Source: Cosima Stubenrauch*, University of Stuttgart

sorb at a range of fluid-fluid interfaces including air-water, oil-water and air-oil. As a result, they are responsible for the stabilisation of foams (aqueous and non-aqueous) and emulsions (simple and multiple). Such dispersed systems may be stable indefinitely to disproportionation and coalescence due to a close-packed layer of particles around bubbles or drops. The controlled assembly of particles at liquid interfaces also enables the preparation of novel materials, including dry water. Recent findings in the following three areas were discussed:

- Preparation of powdered emulsions using particle mixtures.
- Oil powders and oil gels from Pickering emulsions.
- Oil foams and oil marbles stabilised solely by particles of low surface energy.

A. Bismark (co-authors: *Ling C. Wong, Vivian O. Ikem, Shu San Manley* and *Angelika Menner*), Imperial College London, U.K., and University of Vienna, Austria, used "High Internal Phase Emulsions as Template for Porous Polymers". In order to study the morphology of concentrated w/o emulsions *Lissant* used monomers as continuous yet minority oil phase and polymerised the emulsions, whose structure could than easily studied under a microscope. However, the first to report macroporous polymers synthesised by polymerisation were von *Bonin* and *Bartl* in 1962. Since then emulsion templating has emerged as effective method to synthesise macroporous polymers with tailored pore morphology and physical properties. High porosity, low density, interconnected porous polymers are attractive materials for numerous applications, ranging from supports for cell cultures, solid-state chemistry and setting retarded cements. Such polymers are also used in chromatography applications, ion-exchange modules and filters. High or Medium Internal Phase (ratio) Emulsions (HIPEs or MIPEs) with a continuous phase consisting of or containing monomers are used as templates for the preparation of interconnected macroporous polymers, called poly(merised)M/HIPEs, which are obtained after the removal of the internal template phase. PolyH/MIPEs are usually synthesized from emulsion templates stabilised by large volumes of surfactants (commonly around 25 wt.-%). The resulting polymers are interconnected and have porosities of up to 99 %. However, applications of polyHIPEs remain limited mainly because of their poor mechanical properties but also because of their low permeability. In the last decade much research focused on improving the mechanical properties, which was achieved by incorporating particulate reinforcements, increasing the foam density by decreasing the internal phase volume of the emulsion templates or by using different monomers and polymerisation routes. Improving the permeability of macroporous polymers while maintaining sufficient mechanical properties was a more challenging task. Increasing the porosity of interconnected porous polymers results in higher permeability but much reduced mechanical properties. Moreover, the maximum pore throat sizes of porous polymers produced from surfactant-stabilised emulsion templates are limited too by the droplet sizes in the emulsion, which also limits the permeability.

The authors introduced a new class of macroporous polymers called poly-Pickering-M/HIPEs, produced by polymerisation of particle stabilised (Pickering) M/HIPEs. Using particulate emulsifiers provides a number of processing advantages; it removes the need for structurally parasitic surfactant and allows preparing macroporous polymers with much larger pores (up to 1500 μm) as commonly observed in polyHIPEs made from surfactant stabilized emulsions. However, poly-Pickering-M/HIPEs are typically closed-cell. Nevertheless, this new class of polyHIPEs with millimetre-sized pores should allow for very permeable polyHIPEs if the pores could be made interconnected. This was possible by introducing a surfactant to pre-made Pickering emulsion templates. The resulting open-porous poly-Pickering-HIPEs had a maximum gas permeability of 2.6 Darcy. Alternatively, if particles and surfactant were simultaneously used as emulsifiers, macroporous polymers with a hierarchical pore structure with enhanced mechanical properties while maintaining permeability were produced.

Now that a tool kit for new polyM/HIPE architectures is available, the authors believe that this can be combined with different polymer chemistries to produce a whole raft of novel interconnected macroporous polymers for new applications. By selecting appropriate particulate emulsifiers functional macroporous polymers could be created, which by virtue of the liquid template can be given any shape making this a versatile approach for the future.

"Nanoemulsion Formation by the Low Energy Phase Inversion Concentration Method and Their Subsequent Nanoparticles by Polymerization" was highlighted by *M. Elgammal* (together with *M. Gradzielski*), Technical University (TU) of Berlin. Nanoemulsions are a particular class of emulsions consisting of colloidal droplets, transparent or bluish for sizes of 20–100 nm, or milky for sizes up to 500 nm [1]. Nanoemulsions can be prepared by high energy method by application of high shear or by low energy method which depends on phase inversion during emulsification process. The low energy phase inversion concentration (PIC) method was used for the formation of monomer based nanoemulsion droplets, and their subsequent polymer nanoparticles resulting from the ulterior polymerization (Fig. 4) [2, 3]. The monomer nanoemulsion was prepared from a system composed of water/nonionic surfactant/monomer-costabilizer. The nonionic surfactant was either Brij 78 or Brij 700, while styrene, butyl acrylate and methyl methacrylate were used as monomers and hexadecane used as a costabilizer. A detailed phase diagram of the PIC system was done in order to get more details about the intermediate structures obtained during the PIC nanoemulsification. The particle size and polydispersity of the obtained monomer and polymer nanoemulsion were investigated by dynamic light scattering (DLS), small-angle x-ray and neutron scattering (SAXS, SANS) and transmission

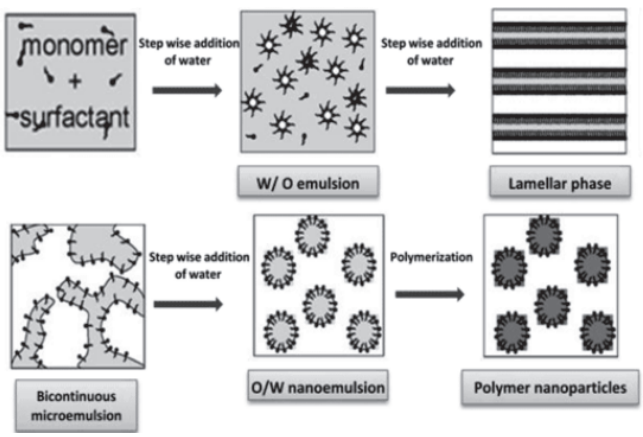


Figure 4 Schematic representation of the nanoemulsion and their subsequent nanoparticles formation by phase inversion composition method (*Source: M. Elgammal*, TU Berlin)

electron microscopy (TEM). The parameters which may affect the PIC nanoemulsion formation such as the oil (monomer)/surfactant ratio, water content, monomer solid content and the water addition rate were studied. Finally, the nanoemulsion polymer particles were applied as binding agents for the pigment printing of cotton fabrics and compared to the nanoemulsion (miniemulsion) polymer particles obtained from high energy method (Fig. 5).

J. Detering, BASF SE, Ludwigshafen, Germany, reviewed "New Trends in the Field of Polymeric Dispersants and Antiscalants". Polycarboxylates based on acrylic acid or maleic acid are well known as very effective dispersants and antiscalants for many years. They are successfully used in detergents and cleaners to prevent the deposition of inorganic salts and particulate soil on fabrics and hard surfaces. In addition they can act as rheology modifier and processing aid. In the field of water treatment and seawater desalination they help to avoid the formation of inorganic scale composed of scarcely soluble salts such as Ca-sulfate, Ca-phosphate, Ca-carbonate or magnesium hydroxide. In the paper industry they stabilize Ca-carbonate slurries of high solid content.

Acrylic acid or maleic acid based polycarboxylates are offered in a broad variety with regard to molecular weight, degree of neutralization and comonomer composition. According to the requirements of the specific application the polycarboxylates can be fine-tuned – a key property which explains their enormous success.

In the last years new polymerization technologies have been developed such as the controlled radical polymerization (CRP) techniques or the micro process technology. The polycarboxylates prepared by these technologies differ in structure and molecular weight from those synthesized *via* the classical routes and are offering a new spectrum of properties.

Besides the anionic polycarboxylates cationic dispersants have been established as effective detergent additives. They show a different mode of action compared to the polycarboxylates giving room for new formulation concepts.

On selected examples was shown how the performance of the polycarboxylates, prepared by different polymerization technologies, is governed by their structure and composition. Further, the mode of action of cationic dispersants of core/shell nature was elucidated. An outlook included biodegradable polymeric dispersants which are gaining more importance due to increasing environmental awareness.

"Properties of Bimetallic Nanoparticles Synthesized in Microemulsions" were analysed by *Ramona Y.G. König*[1] (together with *M. Schwarze*[2], *R. Schomäcker*[2] and *Cosima Stubenrauch*[1]), [1]University of Stuttgart and [2]TU Berlin. Intermetallic PtPb and PtBi nanoparticles (NPs) were synthesized using water-in-oil (w/o) microemulsions as template. For that purpose, w/o-microemulsions containing $H_2PtCl_6 + Pb(NO_3)_2$ and $H_2PtCl_6 + Bi(NO)_3$, respectively, were mixed with a w/o microemulsion containing the reducing agent $NaBH_4$. A variation of the amount of reducing agent led to different particle compositions and sizes, while different ratios of the two metal salts only affected the composition but not the size of the resulting NPs. The size and structure of the microemulsion droplets were studied *via* small angle X-ray scattering (SAXS). The resulting intermetallic NPs were characterized by high resolution transmission electron microscopy (HR-TEM) in combination with energy dispersive X-ray spectroscopy (EDX) and selected area electron diffraction (SAED). The results revealed that it is indeed possible to synthesize PtPb and PtBi intermetallic nanoparticles of $\sim 3-8$ nm in diameter at temperatures of about 30 °C [4, 5]. Current work focuses on the catalytic activity of the intermetallic nanoparticles in comparison to the monometallic Pt nanoparticles. For this purpose the hydrogenation of α-methyl styrene (AMS) and of 1,5-cyclooctadiene (COD) were carried out with the different particles. In this contribution the synthesis of the particles was briefly described. Some details on their size and composition and their catalytic activity were discussed.

H. Fauser (together with *M. Uhlig* and *Regine v. Klitzing*), TU Berlin, described "Adsorption Properties of Cationic Surfactant Mixtures at the Air-Water Interface and in Freestanding Foam Films". Although the application of liquid foams is widespread, too little is yet understood about their stability control. One promising way to tune their properties is the use of oppositely charged surfactant mixtures. Due to electrostatic attraction highly surface active aggregates are formed [6]. Previous work of the group showed a strong impact of catanionic surfactant mixtures on the thickness and stability of free standing foam films [7].

The study addresses the question of whether the adsorption of equimolar or irregular catanionic complexes and thus a variation in surface composition governs foam film properties. To quantify this question surfactants similar in head group charge were chosen and the mixing ratio varied. Mixtures of two widely used surfactants, the anionic sodium dodecyl sulfate (SDS) and the cationic alkyl tetraammonium bromides (C_{12}-C_{16}TAB) are investigated. The authors compared the adsorption behavior at liquid/air interfaces and in freestanding foam films at different total concentrations and mole fraction X.

$$X(C_nTAB) = \frac{c(C_nTAB)}{c(C_nTAB) + c(SDS)}$$

Surface activity was investigated by ring tensiometry. Thin film pressure balance (TFPB) studies gave insight into thick-

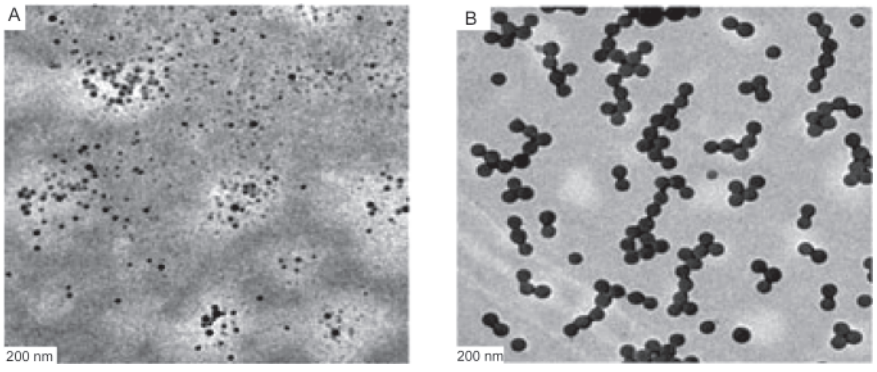


Figure 5 TEM pictures of styrene polymer nanoparticles prepared from PIC method A) Styrene/Brij 78 (20:80) ~ 30 nm, B) Styrene/Brij 78 (90:10) ~ 100 nm
(*Source: M. Elgammal*, TU Berlin)

Young Researcher Prize 2013 awarded by the GDCh Division of Detergency and Formulations to Dr. *Julia Boos*

Dr. *Julia Boos*, together with Dr. *Horst-Dieter Speckmann*, Chairman of the GDCh Division of Detergency and Formulations (Photo: www.katrinheyer.de)

On the occasion of the 9th European Detergents Conference (EDC), the Young Researcher Prize 2013 of the Division of Detergency and Formulations of the German Chemical Society (Gesellschaft Deutscher Chemiker – GDCh) was awarded to Dr. *Julia Boos*, Stuttgart, for her dissertation on "Investigations on the Interface Behavior of Nonionic Detergents and Their Mixtures – Foams, Foam Films, Surface Rheology" In her very sound work, *Julia Boos* succeeded in basically investigating the foam phenomena of nonionic surfactant mixtures and their single components. For the first time she quantified the correlations of the properties of vertical foam films and foams as well as the depletion of active matter in surfactant solutions during foam generation. A new protocol for the investigation of foams allows a quantitative comparison of different surfactant systems. The findings afford a considerably better understanding of the foam behavior of surfactants and surfactant mixtures in different applications in the household.

From 2003–2009 *Julia Boos* studied chemistry at the University of Stuttgart. In the group of *Frank Gießelmann*, Institute of Physical Chemistry, she graduated with a Diploma Thesis on *Kinetische Untersuchungen zur chiralen Induktion cholesterischer Phasen in lyotropen Flüssigkristallen*. After work as an Associate Researcher at the University of Stuttgart, Institute of Physical Chemistry, she has begun her PhD studies in the group of *Cosima Stubenrauch*. She graduated in December 2012 with a Doctoral Thesis on *Untersuchungen zum Grenzflächenverhalten nichtionischer Tenside und deren Mischung – Schaumeigenschaften, vertikale Filme, Oberflächenrheologie*. Since June 2013 she holds a position as Research Scientist at Oelheld GmbH, Stuttgart. From 2009–2013 she took part in cooperation with the group of *Dominique Langevin* at the Laboratoire de Physique des Solides, Paris. In 2012 she received a DAAD Travel Grant for EUFOAM 2012, Lisbon.

In Fulda Julia Boos delivered a short lecture on her outstanding work under the title *On Nonionic Surfactants and their 1:1 Mixture – Foams, Foam Films and Surface Rheology*. Foams are non-equilibrium dispersions of gas in a foaming solution, typically containing surfactants as stabilising agents. Even though foams have been subject of intensive investigations over the last few decades, many important questions related to their stability remain open. This concerns in particular foams containing mixtures of surfactants, creating synergy effects which are strongly exploited in a wide range of industrial applications. In order to gain a deeper understanding of these synergies, *Julia Boos* has chosen to work with a model surfactant system, which consists of two commonly used nonionic surfactants: a sugar-surfactant, *n*-dodecyl-β-D-maltoside (β-$C_{12}G_2$), and hexaethyleneglycol monododecyl ether ($C_{12}E_6$) as well as their 1:1 mixture [1, 2].

For a better understanding of this work it should be noticed that three-dimensional foam is a complex structure which decays due to three main mechanisms [3]. To understand the stability of such a complex system one can analyse, amongst others, the foam film as smallest unit of this overall structure. Furthermore, foam can only be generated if surfactant molecules adsorb at the water/air-interface. This means that in addition to the analysis of the foam films the water/air-interface needs to be studied as well. For this purpose, the adsorption of the surfactants or the rheological properties of the surfactant monolayer can be investigated. In other words, these properties of freestanding foam films and the water/air-interface contribute to the understanding of foam properties.

The first part of the work is about properties of foams stabilized by β-$C_{12}G_2$, $C_{12}E_6$ as well as by their 1:1 mixture, which are studied with the commercially available FoamScan (Teclis).

The depletion of the surfactant solution during foaming has been determined quantitatively both theoretically and experimentally [4]. Furthermore, a protocol for studying and comparing aqueous foams has been established [5]. This protocol leads to foams with similar structures and therefore allows one to compare the properties of different foams. It has been shown that differences in foam properties (β-$C_{12}G_2$ generates a stable foam, whereas the foam stabilized by $C_{12}E_6$ is extremely unstable) are due to different surfactant packing at the water/air-interface (structure-property-relation). In the second part dynamic studies of vertical foam films stabilized by β-$C_{12}G_2$, $C_{12}E_6$ as well as by their 1:1 mixture have been investigated [6]. With this experiment the lifetime of the foam film, the film thickness, the critical film thickness before rupture and the drainage rate of the vertical foam films have been studied. In the last part of the work the rheological properties of the water/air interface, namely the dilational viscoelasticity, have been examined [7]. The measured differences in the viscoelasticity of the water/air interfaces can be correlated with the differences in the foam stabilities. The greater the elasticity the stronger is the resistance against external influences which leads to a more stable foam.

1. *C. Stubenrauch, P. M. Claesson, M. Rutland, E. Manev, I. Johannson, J. S. Pedersen, D. Langevin, D. Blunk* and *S. D. Bain*, Adv. Colloid Interface Sci. 2010, 155, 5–18.
2. *C. Stubenrauch, L. K. Shrestha, D. Varade, I. Johansson, G. Olanya, K. Aramaki* and *P. M. Claesson*, Soft Matter 2009, 5, 3070–3080.
3. *D. Exerowa* and *P. M. Kruglyakov*, Elsevier, Amsterdam, 1998.
4. *J. Boos, W. Drenckha* and *C. Stubenrauch*, Langmuir 2012, 28, 9303–9310.
5. *J. Boos, W. Drenckha* and *C. Stubenrauch*, J. Surfact. Det. 2013, 16, 1–12.
6. *L. Saulnier, J. Boos, C. Stubenrauch* and *E. Rio*, submitted to J. Phys. Chem.
7. *J. Boos, N. Preis* and *C. Stubenrauch*, Adv. Colloid Interface Sci. 2013, 197, 108–117.

ness and interactions in foam films. These properties are connected to the surface charge of foam films.

Surface tension measurements show high surface activity for these mixtures already at very low concentrations, much lower as for the pure surfactants. The same high surface activity is detected over a broad range varying in mole fraction X (0,1 to 0,9). In contrast TFPB measurements reveal a huge variation in the foam film properties for different mixing ratios. Foam film thickness and stability varies with the mole fraction. Mixtures with excess of SDS or C_{12}TAB show completely different behavior in comparison to foam films for equimolar catanionic mixtures (X = 0,5). This leads to the conclusion that with varying mole fraction X the surface activity for the catanionic complexes is the same whereas surface composition changes. But it has been shown that foam film properties are also highly dependent on the chain length of the surfactants used. The influence of surface elasticity and adsorption time of the surfactant complexes on foaming behaviour has also been discussed.

Sven Riemer (together with *M. Gradzielski*), TU Berlin, delivered a "Study of the Self-aggregation Behavior of Hydrophobically Modified Polyacrylates". Hydrophobically modified polyacrylates were synthesized by Atom Transfer Radical Polymerization technique. Starting from an initiator, the reaction was carried out in a mixture of *tert*-butyl acrylate, which is easy to hydrolyse subsequently, and another alkyl acrylate, where the length of the alkyl chain and the monomer ratio was varied. The reaction progress, composition and the purity of the product was followed by ^{1}H-NMR, molecular weights were determined by GPC. Such hydrophobically modified polyelectrolytes have a potential for pH-dependent self-aggregation in aqueous solution. Due to its architecture it can form both inter- and intramolecular micelles. The aggregation behavior can be affected by experimental parameters.

The self-aggregation behavior for the polymers was investigated as a function of pH by means of scattering methods (SLS, DLS, SANS). Then, the structure of the formed aggregates was systematically correlated with the structure of the polyelectrolyte. For potential further applications, such as delivery system, the solubility of substances into the hydrophobic domains is an interesting next step.

"The Adsorption of Surfactant Mixtures on Solid Surfaces and Importance for the Stability of Dispersions" was presented by *W. von Rybinski* (co-authors: *Maria Bous* and *Meriem Jabnoun*), University of Düsseldorf, Germany. Mixtures of anionic and nonionic surfactants are key ingredients in detergents and cleansers. In these applications the different surfactants interact with each other and with various surfaces in the system. This regards especially the dispersion of solid particles in aqueous systems and the removal of soil. The adsorption mechanism of surfactants at the solid-liquid interface is one important parameter for the dispersing process and the stability of dispersions.

In the present study the adsorption process and the interaction of anionic surfactants, nonionic surfactants and their mixtures on non-polar and polar surfaces has been investigated using a combination of different methods. Surface tension measurements, adsorption studies, calorimetry, atomic force microscopy (AFM) and high-resolution fluorescence microscopy are used in order to propose a model for the adsorption of mixtures. A direct correlation of the results of the adsorption measurements to the stability of the dispersions was possible.

Poster Prizes of the GDCh Division of Detergents and Formulations

The First Prize was awarded to *J.C. Thater*, University of Stuttgart, for his Poster "Microemulsions with Ionic Liquids – Interfacial Tension and Microstructure". *R. Bernin*, University of Potsdam, received a Second Prize for his Poster "Novel Water-soluble Polymers Made from Bio-based Building Blocks". A Third Prize was awarded to *T. Lukowicz*, Université Lille I and ENSCL, for his Poster "Aqueous Fragrance Solubilisation in Temperature Insensitive o/w Microemulsions Based on Synergistic Mixtures of Nonionic and Anionic Surfactants".

Furthermore, Posters were also presented by *Carolin Ganas* (together with *M. Gradzielski*), TU Berlin, on "Micellar Inter-polyelectrolyte Complexes for Application in Drug Delivery", by *Davina Lemm* (co-authors: *R. Lucassen, Nadine Merettig* and *D. P. Bockmühl)*, Rhine Waal University of Applied Sciences, Kleve, on "Efficacy of Common Domestic Cleaning Procedures on Norovirus-contaminated Surfaces" and by *F. Stahlhut*[1] (co-authors: *A. Laschewsky*[1, 2] and *H. v. Berlepsch*[3], [1]University of Potsdam, [2]Fraunhofer Institute of Applied Polymer Research and [3]Free University of Berlin, on "Self-assembly of Amphiphilic ABC Ternary Block Copolymers Containing One Hydrophilic, One Hydrophobic, and One Stimulus-responsive Block". *Johanna Nunweiler* (together with *Nadine Merettig, R. Lucassen* and *D.P. Bockmühl*) asked "Can We Trust Granny? A Comparison of the Antimicrobial Efficacy of Sanitizers, Non-disinfecting Cleaning Products and 'Household Remedies'". Additional Posters have been "Complexes of Biopolycation Chitosan and Oppositely Charged Alkyl Ether Carboxylates: A Smart System" prepared by *L. Chiappisi*[1], *S. Prévost*[1,2] and *M. Gradzielski*[1], [1]TU Berlin and [2]Helmholtz Center Berlin, and "Dynamics and Structure of the Lipase *Candida antarctica* B in Bicontinuous Microemulsions" presented by *Mirela Subinya*[1], *Cosima Stubenrauch*[1] and *Sandra Engelskirchen*[2], [1]University of Stuttgart and [2]University of Durham, U. K. Posters were also presented by *R. Company*[1] (together with *J. F. Ontiveros*[2], *J.-F. Aubry*[1] and *Véronique Nardello-Rataj*[1]), [1]Université Lille Nord and [2]Universidad de los Andes, Mérida, Venezuela: "Microfluidic Emulsification for a Cosmetic Formulation", and *K. Mayahara*, Kuraray Europe GmbH, Hattersheim: "Use of MMB in Cleaning and Washing Formulations".

Detergents and Cleansers: Trends in Detergency

Pre-portioned detergents gain increasing acceptance by consumers and overcome their niche image. *F. Meier*, Henkel AG & Co. KGaA, Düsseldorf, presented "Sachets, Caps, Pouches, Pods & Co. – The Latest Trends in Pre-portioned Detergents". Table 1 shows the recent market share of different liquid detergent product forms. The marketing of these laundry detergents is challenging the product development with regard to suitable raw materials and manufacturing processes. In addition, the testing of compatibility of formulations and water-soluble films and last but not least the detailed assessment of product safety are new tasks. On the other side, based on the special product design there are unsuspected possibilities to introduce new raw materials and technologies.

Figure 6 shows that liquid concentrates are on the rise. Figure 7 gives formulation insights – barriers and opportunities. Figure 8 illustrates pack shots – Persil DUO CAPS.

More and more professional laundries consciously choose for a sustainable approach, reducing their energy and water consumptions. However, they still strive for maximum hygiene and cleanliness. *Cécile Viry* (together with *F. de Meulemeester*), Christeyns, Gent, Belgium, recommended "Low Impact Washing – New Chemistry". Christeyns helps laundries to wash with low impact on ecology and economy, without making compromises on processing efficiency or cleaning results. How? By offering the right chemistry. Low Impact Washing is more than just saving water and energy. It starts with precise dosing thanks to accurate dosing equipment, careful monitoring of the dosing process *via* Management Information Software and using water & energy saving equipment. But it is also about applying adapted and efficient washing processes combined with innovative chemistry.

According to the *Sinner* circle rule, reducing the water and energy consumption should result in the use of more chemicals to obtain optimal washing quality. However, Christeyns is convinced it should not necessarily be about using more, it can also be about using different chemistry. By completely re-thinking the conventional way of formulating laundry detergents, Christeyns was able to develop a whole range of new products based on truly innovative components. It is safe for the human body, the environment and the textile, guarantees a good hygiene level on the textile and in the laundry itself, and keeps or even improves the washing quality.

Region/product form	Market share [%]
Western Europe[1]	63
Pre-dosed liquid laundry capsules	7.7
Liquid super concentrates	5.0
Liquid concentrates	23.7
Liquid regular laundry detergents	26.6
Great Britain (pre-dosed laundry detergents)	18
France (pre-dosed laundry detergents)	17
Italy (pre-dosed laundry detergents)	11
Germany	4.5
US	8.5

[1] Germany, France, Italy, Netherlands, Belgium, Portugal and Greece

Table 1 Liquid detergents in Western Europe 2012 (acc. to Trade Panel Data)

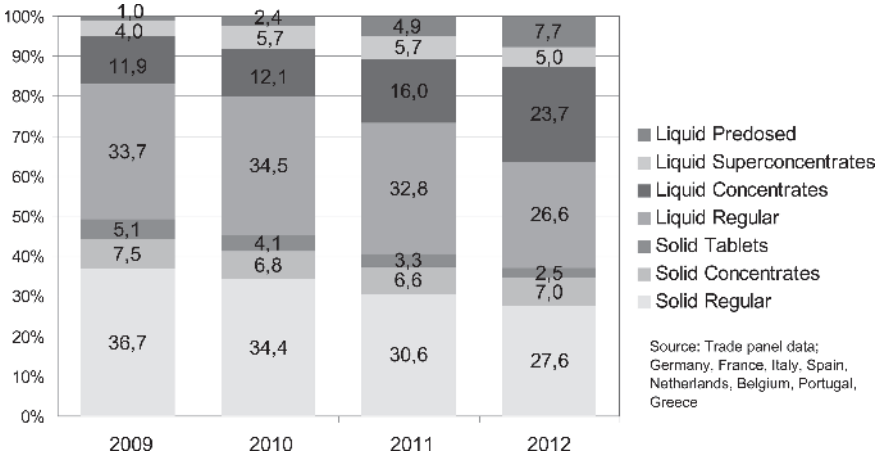


Figure 6 Liquid concentrates are on the rise (*Source: F. Meier*, Henkel)

This new Low Impact chemistry is used with an adapted and well balanced washing process, offering the possibility to wash at lower temperatures. However, low temperature is only one aspect in low resource consumption. The whole laundry process needs to be taken into account. According to case studies, the first field trials in Europe were very successful and prove to be very promising.

Detergents and Cleansers: Cleaning and Hygiene

Biosurfactants are an interesting alternative to petroleum-based raw materials because of their sustainable manufacturing and of their special properties making them attractive for the use in cleaning and laundry detergents. *D. Bockmühl*, Rhine Waal University of Applied Sciences, Kleve, Germany,

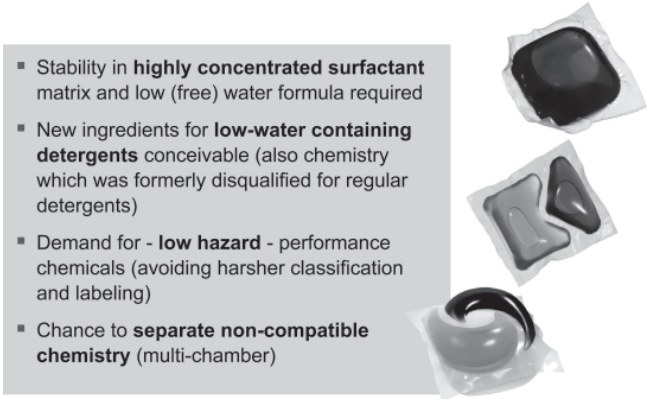


Figure 7 Formulation insights – barriers and opportunities (*Source: F. Meier*, Henkel)

Figure 8 Pack shots – Persil DUO CAPS (*Source: F. Meier*, Henkel)

reported on "Antimicrobial Properties of Sophorolipids in Detergents and Cleaners". In addition to the cleaning effect of surfactants sometimes an antimicrobial effectiveness is observed with surfactants of biological origin. These biosurfactants produced by bacteria are able to take off water-insoluble substrates, provide cell adherence and cause an antagonistic effect to other microbes from which an antibacterial, antifungal and antiviral effect arise. A distinction must be made between the microbistatic, microbicidal and antiadhesive effects, which are defined as MIC value (lowest concentration for a biostatic effect), as MBC value (concentration for a biocidal effect) and as the lowest concentration for the adhesive effect, meaning the deposit of microbes.

Sophorolipids, which are belonging to the group of glycolipids will be produced by *Candida (Starmerella) bombicola*. They are one of the few biosurfactants which are industrially available and therefore are of interest for cleaning detergents.

Formal Address Delivered by *Brother Paulus,* Guardian of the Capuchin monastery of Liebfrauen, Frankfurt/Main:
Heart Detergents – How the Ten Commandments Can Cleanse the Mind for Real Success

Brother Paulus (Photo: www.katrinheyer.de)

To be pure in heart – a desirable trait, but only few can explain it. "Heart" – that is the center of the human being. There, where, I am me; where I am unique.

Pure in heart are the people who take pleasure in their humanness, who encourage their fellow beings to enjoy their humanness.

A pure heart – it recognizes beyond the biological sense, with the heart, intuitively, that something exists between people and between people and the world. It appeals to us, challenges us and leads us on. A pure heart recognizes that it needs other hearts. A pure heart is humble and knows that no one can live without others.

The Ten Commandments as detergent for a pure heart

The Ten Commandments – they are written in the Jewish covenant: It is said that God could no longer endure to see how his people had polluted their pure hearts.

Therefore, he gave them a wake-up call, an explanation: The Ten Commandments. They begin with: "You are freed by me, your God, into freedom."

He who finds it difficult to believe in God or even rejects this belief can nevertheless adopt this passionate pleading for a pure heart to his advantage. In the sense of: "Human, you have a spiritual center in you, a heart that longs for Love, Freedom, and Justice."

If you understand that, you will listen to your heart, purify it and in the process…

- Not let yourself be caught by glossy brochures and expectations of profit.
- Not wish to steamroller anyone with what you do or say.
- Not let your time be determined by money and success.
- At the end of your life pay back the time that your parents dedicated to you at the beginning of yours.
- Acknowledge the value of life, whether it is in the womb or in a coma, as mission and not as disturbance.
- In friendship and in marriage wish to live in respect for all the stages of life along the whole length of life's path.
- Be satisfied with what you have honestly acquired by the sweat of your brow.
- Rather be true and transparent than deceitful and full of twiddle-twaddle.
- Never be convinced of everything but always be prepared to doubt and to join with other hearts in the search for the truth that is always between you.
- Find yourself in the fun of the joy of others and not lose yourself in the shortsighted fun of enjoyment.

Pedagogic washing instructions

Why I do not wash:

- I was forced to wash as a child.
- People who wash themselves are hypocrites; they think that they are cleaner than others.
- There are so many types of soap. How can one know which is the right one?
- Soap manufacturers are only after the money.
- I tried it once, but it was boring.
- Soap is only for fanatics and blockheads.
- He who meddles with soap, gains something unrealistic. I prefer to stay in the dirt – at least I have something concrete.
- None of my friends finds washing necessary.
- I really have no time to wash.
- Perhaps I'll wash myself sometime, when I am older.

Ergo, to withdraw from this immature defense against the detergent for the heart and allow it's cleaning – that is our task as human beings.

He who continually cleanses his heart in this way will preserve its purity. To be sure, it requires an adult attitude that does not find freedom in releasing ourselves from all values and duties, but in the acceptance of values that blossom, when we with a pure heart allow them to emerge within us. And then not become obstinate, but rather do what the heart tells every human being – that is mature life. Wholesome action follows.

For sophorolipids a fungistatic effect has been determined against different test germs, e. g., against *A. niger, C. cladosporioides, E. spinifera, P. brevicompactum* and *P. chrysogenum*.

Investigations with an expanded range of germs about the antimicrobial efficiency of sophorolipids have shown that a biocidal efficacy of sophorolipids similar to the antibioticum *Polymixin B* against gram-positive germs like *S. aureus, B. subtilis, E. hirae* and *S. epidermidis* at a concentration of 100 µg/mL is given, while against gram-negative as *E. coli* and *P. aeruginosa* as well as against fungi and yeasts such as *C. albicans* a concentration of 4 mg/L is necessary. In this context account has been taken on the influence of the pH value and on the interaction with the other surfactants. Whereas a disinfecting effect will not be achieved a supporting effect for the preservative system is obtained.

The biocidal reaction which is obtained with active chlorine containing laundry and cleaning detergents was summarized by *C. Block*, Colgate-Palmolive GmbH, Hamburg, Germany, for "Chlorine-bleach-based Cleaners in Home Care: Application of the Future?" Hypochlorite containing cleaners have been used for thousands of years in the form of 'Eau de Javel' for bleaching and disinfection and are up today still applied in households for different applications. Along with the textile bleaching active chlorine is used with an emphasis on cleaning and disinfection of hard surfaces, for instance to remove moulds which has become an increasing problem in the household sector. But in the context of technical and regulatory restrictions the free options for the formulation and the design will be more or less restricted resulting in a clear and focused product appearance.

Typical household liquid bleach contains < 5 % sodium hypochlorite, 0–1 % sodium hydroxide, 0–0.2 % sodium silicate, 0–5 % sodium carbonate, 0–0.2 % anionic and nonionic surfactants, 0–0.05 % perfume and water. Depending on the pH value in an aqueous chlorine solution of 0.1 M Cl_2 at pH 1–10 at first HOCl is formed, which exchanges at pH 10 into NaOCl and will dissociate to OCl^-. Hypochlorite containing bleaches are predominantly used for cleaning hard surfaces and for laundry treatment to remove different bleachable stains and discolorations, but also mold and malodors. Such cleaners are traditionally used in Spain and Belgium, but also in Austria they are distinctively applied for the cleaning of WC rooms, bathrooms and sinks. In machine washing the chlorine bleach is dosed by using an extra compartment, which is mounted in the pre-wash detergent compartment of the detergent dispenser. The chlorine bleach will totally inactivate noroviruses while with ethanol, antibacterial cleaners, WC and bathroom cleaners only an insufficient removal will be reached (Examinations of *D. Bockmühl* et al., Efficacy of Common Domestic Cleaning Procedures on Norovirus-contaminated Surfaces, Rhine Waal University of Applied Sciences, 2013). The classification and labeling of sodium hypochlorite (CAS 7681–52–9) according to DSD/CLP is compiled in Fig. 9.

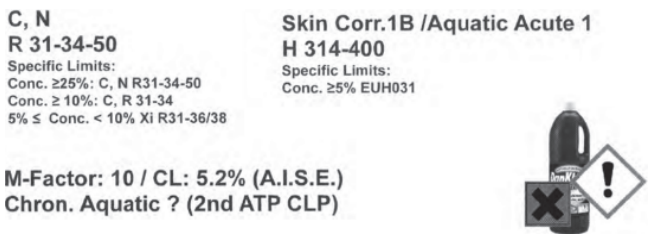


Figure 9 Classification and labeling of sodium hypochlorite (CAS 7681-52-9) according to DSD/CLP (Source: C. Block, Colgate-Palmolive)

Till now, phosphate has been playing the core role in classic and multi-benefit detergents for automatic dishwashing. It has been a "star" performer as builder and was even seen as "mother" of cleaning. Especially in hard water oasis Europe, phosphate became so indispensible for automatic dishwashing, that it survived the voluntary industry agreement not to use phosphates in laundry by 3 decades. As of 2017, the phosphate era in ADW will be over. By then, dishwashing detergents in Europe have to be phosphate-free. "Phosphate-free Cleaners for Automatic Dish Washers" were recommended by *J. Kielholz*, Reckitt Benckiser, Ludwigshafen. In the 1990's our industry tried their phosphate-free "Spring", failed and returned to phosphate. At that time our industry rescued itself by reverting back to the classical and proven technology. For 2017 European law has closed the option to return.

How difficult it still is, 20 years later, to deliver a high performing phosphate-free technology, has been shown in 2010, when US quit their phosphate route. How much bigger will the job be, when hard-water-Europe bans this chemistry? Multi-benefit detergents, designed to perform at higher water hardness are the biggest segment in the European ADW market. To deliver "today's" performance also "tomorrow" will possibly pose the biggest technical threat the dishwashing industry ever faced since its origins.

This presentation attempted to explain the past importance of phosphates and illustrated the challenges and learning from the historic trial away from phosphate. It described the measures that have been taken to deliver phosphate-free products to the US and discussed whether they will meet the task also for Europe. In a broader context, the presentation summarised some of the impacts the post-phosphate era will have on several industries, namely raw material suppliers, detergent manufacturers and machine producers

Ionic surfactants derived from coconut or palm kernel oil contain C_{12}–C_{14} carbon chains which are soluble in water. Contrary ionic surfactants received from European oils having longer carbon chains are no longer water-soluble. With the exchange of the counterion Na^+ or K^+ by choline a quaternary ammonium salt is formed by which the cristallization is hampered, and the ionic surfactants will also become water-soluble. *W. Kunz* (co-authors: *Regina Klein, Doris Rengstl, S. Wolf* and *D. Touraud*), University of Regensburg, Germany, asked on this basis the possible "Washing with choline surfactants in the year 2020?" Using choline as a counterion even long-chain alkyl sulfates can be dissolved at room temperature having excellent washing properties at lower washing temperatures and will remove even stubborn soil from fabrics. This offers a significant contribution for an energy efficient laundry.

Though choline is in the kind of vitamine B_4 admitted as food additive, however, in Europe it is not permitted as a cosmetic additive in consequence of the general prohibition of quaternary compounds for cosmetics. While choline carboxylates having good biodegradability and high water solubility are very sensitive against electrolytes choline sulfates are not affected by salts. For instance, choline dodecyl sulfate has a *Krafft* point of < 0 °C, sodium dodecyl sulfate of 14 °C and choline hexadecyl sulfate of 16 °C. Aqueous solutions of 1 % ChS_{18} will be after addition of different additives after cooling below 0 °C and heating at a rate of 1.5 °C/h to room temperature clearly soluble. In addition choline and sodium carboxylates have comparable IC_{50} values, and there is no linear dependence in the cytotoxicity of the alkyl chain. Over this, the cytotoxicity will not be affected by a double bond in the carbon chain (choline oleate compared to choline). The products are toxicologically harmless. Compared

SEPAWA Awards 2013

The yearly sponsored SEPAWA awards belong to one of the prior activities of the association and serve to the recognition of qualified young upcoming generations. The prize is given to students of excellent qualifications for their Diploma and Bachelor theses as well as for outstanding Doctorate theses.

From the submitted theses the jury selected five prize winners. In the category of outstanding university graduates the First Prize was given to *Lea Kemper,* University of Applied Sciences Hamburg, for her master thesis about "Evaluation of the skin-caring effects of cosmetics with tangible solids and their acceptance by consumers". The Second Prize gained *Tobias Conrady,* University of Bonn for his diploma thesis "Influence on the sustainability of the washing procedure by motivating discussions". The Third Prize was given to *Kim Hughes,* University of Applied Sciences Lower Rhine, for her master thesis on "Investigations on the influence of disinfectants on the barrier effect of textiles for use in clinical operations".

Two prizes were awarded for excellent doctorate theses: to *Dr. Anna Miasnikova*, University of Potsdam, for her doctorate thesis "New hydrogel formimg thermo-responsive block copolymers of increasing structural complexity", and to *Dr. Natalie Fuss,* University of Bonn, for her doctorate thesis on "Determination and verification of possible resource savings in manual dishwashing".

to classic 1:1 molar cationic mixtures (SDS DTAB and LES DTAB with LIPA ($C_{10}EO_3$ C_8NH_3) a 10-fold lower IC_{50} value is remained.

Enzymes are widely used in laundry and dishwashing detergents to help formulators meet consumers' high performance expectations, to boost detergent ratings in consumer magazine and institute trials, to comply with regulatory requirements and to fulfil retail demands. "Novel Enzyme Stabilizing Technologies" were outlined by *P. D. Hede*, Novozymes, Copenhagen, Denmark. By continuously innovating enzyme solutions for powder and liquid detergents, Novozymes facilitates formulation flexibility and optimization, cost savings and brand loyalty *via* higher performance.

Novozymes' latest innovation is a novel enzyme stabilization platform which will bring new bio-innovation technology standards to the market.

Sustainability and Product Safety

By 2020 there will be 1.5 billion washing machines in operation globally. That's a lot of machines, a lot of energy, a lot of water and also a lot of detergent to operate them. On the basis of increasing resource consumption *I. Bell*, Euromonitor International, London, United Kingdom, explicated "Sustainability – global overview". In order to meet future challenges and get a share of future growth, multinational brand owners have, for the most part, set themselves a range of challenging medium term goals to help focus and drive their businesses further towards more sustainable operations.

The development of sustainability as a core business aim is fast becoming something of a rite of passage to operate "successfully" as a multinational on the international stage. The trick is however, how to resist the temptation of shale gas and a new energy bonanza while developing a value chain which puts sustainability at its core. How to engender cooperation, collaboration, common goals and trust within a system which has in some cases actively sought to undermine such notions? Sustainability is not a new idea, but in need of new thinking.

Thema 1 is an independent Berlin-based think-do-tank specialized in accelerating the transition to a low carbon-society. *G. Axmann*, Thema 1, Berlin, reported on "Product Environmental Footprint as the Central Tool for the European Union's Sustainability Policy". In springtime 2013 the European Commission published a notice to promote an internal market for Green Products involving a recommendation for the application of methods measuring both the Product Environmental Footprint (PEF) and the Organization Environmental Footprint (OEF). The EU Commission's initiative which is positively assessed by the majority of the EU member states will be the starting point for future regulations about the product sustainability in the internal market. For creating important methodological principles as so-called Product Category Rules for the direct comparison of environmental performance of products and of organizations as well as creating communication media for supplier tests, e. g. benchmarking, and consumers, e. g. product labeling, the EU Commission is starting in September/October 2013 a three-year EU PEF/OEF pilot phase.

The Berlin-based think-do-tank Thema 1 has founded in 2009 the PEF World Forum (formerly PCF World Forum) as a global platform for the practical exchange of experience of international initiatives in the range of product-orientated balances of environmental and CO_2 footprints. After a first PEF Policy Conference at the end of April 2013 the selected projects were discussed at the beginning of the pilot phase during the 1st PEF World Summit in Berlin from 8–9 October 2013. The Newsletter of the PEF World Forum informs regularly about relevant events and the newest developments of the topic "Product Sustainability": www.pef-worldforum.org.

For the evaluation of eco-design and eco-labeling *M. Ooms*, RDC Environment, Belgium, presented "Advanced LCA Computer Tools for the Modeling of Product Environmental Footprint Scenarios". On 9 April 2013, the European Commission made a Communication on Building the Single Market for Green Products and highlighted the need for PCR development (called PEFCR) in order to bring comparable and reliable environmental information at the product level. During a 3-year pilot phase, starting in summer 2013, Product Environmental Footprint Category Rules (PEFCR) will be developed and tested at European scale.

In parallel, further efforts are necessary in order to make it easier for companies (and especially SMEs) to apply Life Cycle Assessment according to relevant PCRl. Companies might be confronted by requests to provide life cycle environmental information to their clients, and companies active on green markets need to have access to tools that help them compete based on environmental performance. In the application of new environmental solutions, the simplicity, cost and the training needed to implement LCA and eco-design strategy measure are important factors for all companies.

The Instant LCA^{TM} tool is an innovative eco-design and eco-labeling tool, enabling non-experts to easily and instantly evaluate the environmental impacts of their products and packaging. The proposed concept consists of pre-integrated data models and algorithms that can be adapted by companies using pre-identified relevant parameters accessible through a user-friendly interface. It allows non LCA experts to quickly identify the best eco-design scenarios and ease the data collection process.

A. Boenke, EU Commission, Brussels, Belgium, described the "EU Strategy on Bio-based Chemical Substances". The Competitiveness Council invited the Commission [8] "to present during 2007 an initiative on lead markets". In response, a Communication on a Lead Market Initiative (LMI) [9] was launched. This Communication identified a first set of markets with potential to become LMs including also one on "Bio-based Products". Within this bio-based product LMI standards are seen as essential elements in aggregating initial demand, especially, for new bio-based products. Both the LMI Communication and the Report [10] from the Ad-hoc Advisory Group for Bio-based Products in the framework of the European Commission's Lead Market Initiative concluded that standards may facilitate the development of LMs.

The first standardization documents are now available addressing bio-based polymers and bio-based lubricants as first bio-based product groups. Also, a CEN report on the Mandate for the programming of standards for all types of bio-based products was received and lead to two new standardization mandates covering bio-based surfactants, solvents and bio-based products as a whole. Building upon these standardization outputs labeling work as part of the European eco-labeling started by publishing the first Commission Decision 2005/360/EC on establishing ecological criteria and the related assessment and verification requirements for lubricants.

In Green Public Procurement (GPP), a voluntary instrument, the use of renewable raw materials was specially addressed as part of the core and award GPP criteria for, e. g., food and catering services. The Lead Market Initiative for Bio-based Products was completed by the end of 2011. In March 2012 the European Council called in its conclusions for action in the field: "Creating the best possible environment for entrepreneurs to commercialize their ideas and create jobs and putting demand-led innovation as a main driver of Europe's research and development policy". Consequently, the revised Industry Policy Communication entitled "A Stronger European Industry for Growth and Economic Recovery – Industrial Policy Communication Update" [11] announced that, starting in late 2012, the Commission will implement an action plan to boost the demand for innovative European goods and services building upon wide-range of existing demand-side policy instruments at EU level including standardization, stimulating public and private consumption of innovations, promoting uptake of innovations in global supply chains, incentives in regulatory frameworks, greater involvement of end-users, etc., and as a follow-up European Commission Internal Task Forces were set-up to implement these activities amongst them the Task Force on Bio-based Products.

Linked to these actions the European Commission Strategy and Action Plan entitled "Innovating for Sustainable Growth: A Bio-economy for Europe" [12] was launched aiming at shifting the European economy towards greater and more sustainable use of renewable resources.

The development and actual situation of palm oil derivatives certified by the Roundtable on Sustainable Palm Oil (RSPO) was contemplated by *Martine Dols,* Kolb Distribution Ltd., Hedingen, Switzerland, regarding the situation of the "RSPO Supply Chain and Surfactants – A Match Made in Heaven?" Since SEPAWA last year Kolb offers RSPO certified nonionic surfactants. This is a first step towards a long term goal set by the industry and its stakeholders to have only RSPO certified palm oil derivatives. 2015 is the magic year mentioned in many brand leaders' strategies. How far are we to date? What is the impact of this initiative and is the supply chain already in motion? Why is there a greater supply of certified palm oil than demand, despite the target setting by the pioneers of this industry?

RSPO is an international multi stakeholder organization and certification scheme for sustainable palm oil founded in 2004. Kolb's mother company, Kuala Lumpur Kepong Berhad (KLK) is one of the founding members of RSPO. The mission of RSPO is transforming markets to make sustainable palm oil the norm. To achieve that all oil palm plantations and mills are RSPO certified and only sustainably produced palm oil and palm kernel oil are used downstream. Many RSPO member companies are committed to reach this target by 2015.

RSPO defined 4 different supply chain models to handle certified sustainable palm oil and its derivatives. The models have an ever increasing complexity. For a detailed description of the supply chain models, please have a look at www.rspo.org.

To produce nonionic surfactants for detergent and personal care products, mainly palm kernel oil derivatives are used because of the C-chain length that is providing the needed properties. Table 2 shows the development of supply and uptake of CSPO and certified sustainable palm kernel oil (CSPKO). For both CSPO and CSPK, the supply is bigger than the demand. CSPKO shows a larger gap. Sales

Supply 6 Sales of CSPO, CSPKO					
source: RSPO	2008	2009	2010	2011	2012
SUPPLY					
CSPO (mt)	163,364	1,357,511	2,773,567	4,798,512	6,724,236
CSPKO (mt)	41,811	321,322	640,316	1,111,998	1,570,070
SALES					
CSPO through SG, MB	–	98,044	438,515	831,010	984,138
CSPO through B&C	4,452	245,813	842,619	1,659,516	2,495,277
CSPKO through B&C	3,520	6,636	82,464	269,665	369,423
% sales vs supply					
CSPO	2,7 %	25,3 %	46,2 %	51,9 %	51,7 %
CSPKO	8,4 %	2,1 %	12,9 %	24,3 %	23,5 %

Table 2 Supply and sales of CSPO, CSPKO (*Source: Martine Dols*, Kolb)

of CSPKO are done through the book & claim (B&C) system.

The palm kernel oil supply chain is more complex than the palm oil supply chain. After refinery and fractionation, the oil can already be used in the majority of the end applications (mainly food). To produce PKO the kernels first go to a crusher that is often a 3rd party who gets supply from different plantations nearby. Then PKO needs several chemical processes to make the end product (mainly non-food applications). Some of these processes are continuous and some are batch processes. For the segregated (SG) and identity preserved (IP) supply chain models a factory has to be completely emptied, cleaned (only very little contamination is allowed) and started again. Next to that separate storage of both the raw material and the end product is mandatory. It will be quite a challenge to get the economy of scale that is needed to make this commercially viable.

Furthermore, the market is highly commoditized and extremely volatile. Players are struggling with the fact the product offering is no longer uniform, since there is now a choice between conventional oil and RSPO certified oil. Due to the extreme volatility of the prices that have been ab-

Marketing Lecture: Open Innovation – The Transformation of Innovation Models in the Digital Age

Dr. *Michael Bartl* (Photo: www.katrinheyer.de)

This year's Marketing Lecture was delivered by *M. Bartl*, Hyve AG, Munich. Open innovation, crowd-sourcing and co-creation characterise current developments in innovation research. The focus is on the changing role of clients from passive service recipients to active partners in a networked value creation process. The active incorporation of the knowledge, ideas and creativity of clients is stimulated by today's media environment, in which social networks and the participatory internet have become important parts of life. With the aid of a case study this lecture showed what approaches are suitable for entering the world and language of consumers and activating the innovative power of the crowd.

The landscape of methods available to companies for collaborative innovation with users is developing rapidly. There are three major groups of methodological developments. The first group can be summarized as *observational research* and focuses on utilizing online communities as source of consumer insights and innovation.

Netnography or Web-Analytics are prominent representatives of this segment. A second group are *co-creation tools* – web-based, interactive, intelligent and playful instruments to engage and empower consumers. *Crowd-sourcing communities* are the third methodological group with the aim to activate the "creative mass" for idea generation and problem solving using open online platforms.

An example to illustrate the power of open innovation programmes is the launch of the new Nivea deodorant called "Invisible for Black & White". The deodorant provides a solution for a consumer need which has long been unanswered. It helps avoid yellow deodorant stains on white clothes and white deodorant stains on black clothes. In order to integrate the consumers' voice beyond traditional market research techniques like concept tests or focus groups, the Nivea Deodorant and Antiperspirant Division instituted a holistic co-creation approach with users in the fuzzy front end of innovation.

The process started with listening to consumers in online communities using the Netnography approach. The analysis of online conversations in more than 200 forums revealed a few surprising insights into users' needs and concerns. What it found was that when it comes to white textiles stubborn yellow discoloration appears in the underarm area after several washes. The discoloration is the result of a chemical reaction. Sweat and deodorant ingredients in the washing machine react with the surfactants in the detergent and together with skin sebum leaves yellow-colored deposits that remain stuck on the fibres of clothes. It was a huge problem looking for a solution. The social media analysis resulted in a "stain manual" encompassing the various stain types perceived by users, assumed causes and potential remedies posted by users. In addition, leading-edge users such as the "The Undershirt Guy" – a blogger simply called TUG (www.undershirtguy.com) – who had been identified during the netnography stage were asked to contribute with their profound staining knowledge and stain removal experiments.

Following the exploration phase thousands of representative deodorant users from different countries participated in an interactive and playful online co-creation study. The study consisted of different research exercises and applications which supported consumers to enrich, modify and select the best deodorant ideas and feature combinations within their applicable market segment. The staining issues proved to be one of the top priority need gaps.

Nivea decided to focus R&D activities on protecting the textile from the stain components and so the search went out for a suitable ingredient that could be used in the deodorant formula. Finally, after intensive testing in the lab and including external partners in the process, a solution was found and a new product was born: The Nivea's "Invisible for Black and White", a revolutionary new deodorant which is now in the marketplace. It provides 48-hour antiperspirant protection and at the same time counteracts white and yellow deodorant stains. The technology also prevents white marks on black clothing. The "Invisible for Black & White" is the most successful product launch in the 130-year history of Beiersdorf. In the first 9 months it was able to outperform the strongest products by competitors. This huge success shows how companies can realize outstanding products by co-creating with consumers following an open innovation strategy [13].

DGP Session: Creativity and Emotionality in the Fragrance Industry

Dr. *W. Krause*

Stefanie Klimpke – DGP Prize winner

Dr. *Markus Gautschi*

Sebastian Maria Fischenich

(Photos: www.katrinheyer.de with the exception of photo *Stefanie Klimpke* (private))

In 2013 the DGP motto was "Creativity and Emotionality". In his introduction Dr. *W. Krause**, President of the DGP, said that this stands for the segments fragrance and creativity and at the same time for the theme fragrance and emotionality. Creativity begins there where sense stops to block thinking. He awarded this year's DGP Prize (2000 Euros) to *Stefanie Klimpke*, Follmann & Co. GmbH, Minden, for her Diploma thesis (private University of Göttingen) on "Verkaufen mit allen Sinnen – Nutzen von Multisensorik zur Absatzsteigerung".

The first Lecture was delivered by *M. Gautschi*, Givaudan Schweiz AG, Dübendorf, Switzerland, on "Emotions through Sandalwood Ingredients–A Successful Evolution". Perfumes evoke emotions! It's the art and creativity of perfumers to blend well chosen ingredients to a perfume creation that evokes emotions, reminds us of past experiences and let's us daydream. The palette of ingredients available to the perfumer for his creations is of key importance.

1968, one year before the structure elucidation of the odor vector of Sandela, *M. Mühlstädt* (Chemische Fabrik Miltitz, Leipzig) discovered the first synthetic and fully characterized Sandalwood odorants. He subjected cheap campholenic aldehyde to aldol condensations and subsequent reductions and some of the molecules obtained had Sandalwood odor. Out of the 3 molecules described in his patent (filed only in GDR), 2 are well known today: Sandal Mysore Core and Bacdanol.

One year later, the perfume industry saw a dramatic price increase of the sandalwood oil (*Santalum album*), due to the uncontrolled tree cutting as well as the lethal infestation of Spike disease. The price increase and the fact that the Miltitz patent was only granted in GDR, spurred the development of the first, campholenic aldehyde derived, Sandalwood odorants: Sandalore (1976, Givaudan) and Sandal Mysore Core (1978, Kao). It is interesting to know that the raw material for the campholenic aldehyde production is turpentine oil, which is obtained from pine trees. Thus an abundant and fast growing tree is used to generate the odor of a precious and endangered tree!

The systematic measurement of odor detection thresholds of key fragrance ingredients led to the "Odor Value" concept. Developed in the 1980's in the perfumery research center at Givaudan, the Odor Value characterizes the olfactory performance of a given ingredient. The Odor Value of an ingredient, a dimensionless unit, is obtained by dividing the vapor pressure by the odor threshold value.

Today perfumers can select from a remarkable number of ingredients with complementary odor and performance profiles, summarized in Table 3, allowing them to create lovely and outstanding perfumes we consumers get emotional about and we just love!

The first synthetic Sandalwood ingredient was introduced to the market in 1960: Sandela (Fig. 10). This molecule resulted from the research efforts of I.G. Farbenindustrie (late 1930's) to find new floral odorants. The systematic investigation of products derived from the reaction of phenols with terpenes led the chemist *Weissenborn* to discover a derivative from anisole and camphene possessing a sandalwood odor. The patent application, filed 1942, was only published 10 years later. In the meantime, the findings were revealed to the perfume industry by the US army intelligence service. Thus, the synthesis of *Weissenborn* was developed by several companies and resulted in the market

launch of Sandela. The odor description as well as the use in perfumery is outlined in the Table 3.

S. M. Fischenich, epok GmbH, Zurich, Switzerland, reported on "Emotionality as Driving Force in the Fragrance Industry". A fragrance is an image – An image is a fragrance: Perfumes not only hold memories – they are elixirs of images and emotions.

Fragrances have the power to form images in front of the inner eye – images which can conjure up joy and longing or lovesickness and fury. Already at the beginning of the development of a perfume "the nose" can be primed with these subjects to kidnap them into unfamiliar worlds and create novel products. Far from pure marketing specifications which are crafted from sales numbers or the competition, products arise, which differentiate themselves from the competition and broadcast their independence. The Lecture showed how fragrances become images, about emotions which are perfumes, and about courage in the industry to enter new paths.

The multi-layeredness of images (color, subject and sign) makes them to a central transmitter of emotions and an important vehicle of the fragrance industry. The author introduced the publication project ODE with the aim to collect images, to illustrate perfumes and to interpret them with images. With numerous examples this concept has been realised.

He also is co-founder of Humiecki & Graef, a new perfume brand. The task is to create perfumes that relate to human emotions or emotional conditions. Four concept examples were demonstrated which underlined this strategy.

After these fascinating lectures, *W. Krause* expressed his thanks to the speakers and announced the Spring Meeting which will take place in Amsterdam on April 10 and 11, 2014, and next year's study trip to Sicily and Calabria from January 28 to February 01, 2014 (booked up), with the heading "Journey to the Lemons".

* On May 23, 2013, *W. Krause* received the *Goldene Ehrennadel der SEPAWA*.

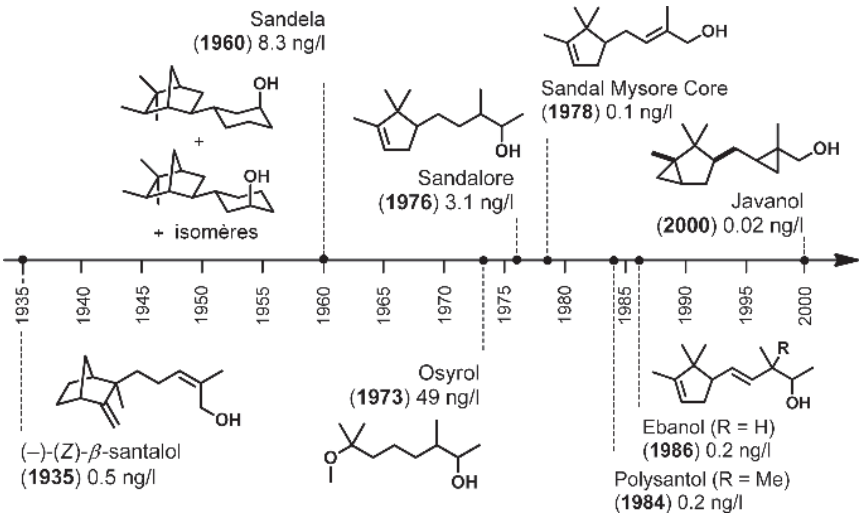


Figure 10 Sandalwood odorants, chronology and odor detection thresholds (*Source: M. Gautschi*, Givaudan)

Ingredient	Odor description	Use[1]	Dose level
Sandela (Sandel, Sandiff, Santalex T)	Woody sandalwood, balsamic, with cedarwood and musky facets	FF: 25%, PC: 44%, FC: 25%, HC: 6%	1 to 25% Moyen: 1 to 2%
Osyrol	Woody sandalwood, with fruity and floral facets	FF: 94%, PC: 3%,FC: 2%, HC: 1%	1 to 15% Moyen: 0.3 to 1.5%
Sandalore	Woody sandalwood, sweet, with musky and floral facets	FF: 23%, PC: 57%, FC: 13%, HC: 7%	0.5 zo 15% Moyen: 1%
Sandal Mysore Core (Santacore, Santalaire, Sandelice)	Woody sandalwood, creamy, with floral, iris-like facets	FF: 31%, PC: 20%, FC: 11%, HC: 38%	0.5 to 5% Moyen: 0.5%
Bacdanol(Radjanol, Bangalol, Sandolène)	Woody sandalwood, creamy, balsamic and floral	FF: 19%, PC: 43%, FC: 30%, HC: 8%	0.5 to 7% Moyen: 1%
Polysantol	Woody sandalwood, slightly fruity, grapefruit	FF: 72%, PC: 16%, FC: 10%, HC: 2%	to 2% Moyen: 0.3%
Ebanol	Woody sandalwood, creamy, floral and a touch vetiver	FF: 8%, PC: 13%, FC: 74%, HC: 5%	to 3% Moyen: 0.5%
Javanol	Woody sandalwood, floral rose, creamy	FF: 10%, PC: 2%, FC: 81%, HC: 7%	0.03 to 1% Moyen: 0.07%
Pashminol	Woody sandalwood, natural, creamy, floral rose with cedarwood and balsamic facets	FF: 90%, PC: 10%	1 to 15% Moyen: 0.5%

[1] Use: the percentages indicated are estimations based on Givaudan consumption figures for 2011. Glossary FF: Fine Fragrances; PC: Personal Care; FC: Fabric Care ; HC: Home Care.

Table 3 Use of synthetic Sandalwood odorants in perfumery

sorbed by the business, there is resistance to accept a mark-up for products with a label representing its sustainable origin.

Kolb has chosen to start with Mass Balanced supply chain (MB). MB is offering the necessary flexibility and minimal mark up, and it shows commitment to evolve to the company goal: "Transforming the markets to make sustainable palm oil the norm".

Due to the globalisation which occurred in the last decades non-governmental organisations (NGOs) have become most important key players on the international political stage. *R. Roth*, Technical University of Applied Sciences, Magdeburg, Germany, described the actual situation of "Non-governmental Organisations and Their Role in the Society of Today". Internet and low transaction costs have facilitated the development of a "transnational civil society", which has its own networks, establish new themes and can mobilize across national boundaries. Hence states, international organizations, trans-national companies and associations have to calculate with this civil society initiatives. The most visible expression of their activities were the global justice movements which were repeated again during the G8/G20 summits of the heads of governments, during the annual conferences of economic organizations like IWF, WB, WTO, etc., and during the World Summit of the UN beginning with Rio 1992.

NGOs have contributed to multifaceted and more unpredictable social affairs, and in addition to agenda setting and to consciousness changing in context with global problems. With such campaigns as for example against landmines immediate success could be achieved. In many cases there is a lack of uniform format and of necessary openings of transnational regimes (Global Governance) by which a productive interaction of NGOs and other transnational players would be promoted.

Based on the first recommendation of the Scientific Committee on Consumer Safety (SCCS) the influences of a possible ban or a limitation of "Fragrance Allergenes and Their Impact on the Cosmetic and Detergent Industry" was described by *D. Grell*, Firmenich, Germany.

In December 2011 a first draft proposal was offered by the SCCS concerning a ban of anthranol/chloranthranol, a limitation of 12 of the most used ingredients of perfumes and of the extension of the labeling requirements which would take a massive effect for the perfume industry as well for the producers of cosmetics. Some initial estimation of the perfume manufacturers revealed additional expenses of about EUR 500 million, whereas from the cosmetic industry 10- to 100-fold higher costs are estimated. Furthermore, certain fragrances would not be reproducible.

Consequently, it is understandable that the industry of the perfume manufacturers under the leadership of the International Fragrance Association (IFRA) and in cooperation with the European cosmetics associations and the AISE an action plan must prepared which would be not only a short-term response to the opinion of the SCCS, but in addition shall insure a long-term work plan to ensure clarity for all involved stakeholders and for the business continuity.

Thanks to the regular discussions the Directorate General SANCO (DG SANCO) stated to realize the disparity between the enormous impacts for the industry and the low benefits for the consumers. DG SANCO welcomes the proposed work plan of "International Dialogue for the Evaluation of Allergens, IDEA" by which it should be possible to define and destine scientifically relevant allergenes. This allows specifically monitoring mechanisms of relevant allergenes (based on the regulations of the Quantitative Risk Assessment, QRA). At first two workshops in the first half of the year 2013 by IFRA could integrate successfully all stakeholders, and it is hoped that the developed momentum cab will stay over the next two years.

Current trends in professional mechanical dish-washing towards "green" technologies require "Challenges and Strategies in Green Mechanical Dish-washing", which were presented by *T. Foster* (co-authors: *F. Schepers* and *S. Klose*), Ecolab Deutschland GmbH, Monheim am Rhein. The implication of green dish-washing technologies demands new approaches in product development. The replacement of traditional raw materials, e.g., nitrilotriacetic acid (NTA) and sodium tripolyphosphate (STPP), by more eco-friendly raw materials towards green technologies as well as developments on the machine-side, e.g., low energy cost and water consumption, do affect established standard processes in mechanically dishwashing significantly. The change from the excellent chelant NTA, which since 2010 has been labeled according to EU directive 2008/58/EG with R 40, towards eco-friendly complexing agents is cost-effective to obtain a performance-neutral replacement. The change of traditional raw materials (such as NTA and STPP) is substantially shifting the conditions described by the *Sinner* circle while the established standard processes in mechanical dish-washing remain unchanged. These variations have to be taken into account during the development work, and thus typically have substantial impact on novel formulations.

As another example, the mechanical dish-washing process can be significantly influenced by wear, malfunctions or the unintended use of dish machines. Information technology solutions as another class of "green" technologies have been introduced to identify such poor operation conditions and to recommend corrective actions through recurring services. These solutions monitor operation parameters like procedures, temperatures and consumables for high quality and sustainable results. Latest developments refer to sustainable and safe programs that integrate the aforementioned single strategies within one combined offering. Such combined offerings integrate sustainable product formulations, packaging solutions and information technology approaches to minimize the environmental impact.

Forum for Innovations

A lot of companies and suppliers presented their latest developments in detergents, cleansers, cosmetics and perfumery in 66 contributions. Here follows the report on the Home Care sector including microbicidal control.

Ingredients for Detergents and Cleansers

M. Hazenkamp, BASF Grenzach GmbH, recommended "Acidic Formulations for Cleaning and Disinfection: Combine the Right Actives for the Best Results". Combining the biocidal active formic acid with the descaling agent Lutropur (methane sulfonic acid – MSA) enables the formulator to develop acidic formulations with strong disinfecting activity *and* descaling and cleaning activity without unpleasant odor.

"Mirapol Surf S310: A New Surface Modification Polymer to Ensure Quick, Easy, Effective and Long-lasting Vehicle Cleaning While Being Eco-friendly" was presented by *Sandra Catarino*, SOLVAY. *Corinna Böhme* (together with *D. Kischkel*), BASF Personal Care and Nutrition GmbH, has been committed to "Hard Surface Cleaning: Enabling Choices!" Lutensol XP types show excellent cleaning proper-

ties even on heavily oily soils. A combination with Glucopon products can significantly improve foam stabilisation, gloss retention and plastic compatibility.

C. Cohre, Clariant International Ltd., promised "The Perfect Viscosity for Your Dishwashing Liquids". TexCare SRN 170 offers a high-performance and environmentally friendly alternative as a low VOC and solvent-free solution for controlling the viscosity of concentrated dishwashing liquids. "The Effect of Peracetic Acid Generated from Persalt and TAED on Contaminated Fabrics and Washing Machines" was analysed by *A. Theobald* et al., Warwick Chemicals. Levels of 150 ppm peracetic acid were sufficient to reduce the loading of two bacterial strains on fabric and in wash water by greater than 3 log units (> 99.9% reduction) in the ASTM E2406-09 and E2274 tests at 30 °C with a 12 minute contact time. *Severine Laurin*, Dow Coring Corp., recommended the "Use of Silicone Foaming Control Agents in Liquid Laundry Detergents. *Anja Finke* (co-authors: *P. Ott* and *J. Wiedemann*), Symrise AG, introduced "Fresh, Clean and Long-lasting Odor for Liquid Detergent" with the help of encapsulated fragrances.

"New Detergent Cellulases for Laundry Detergents" were recommended by *K.H. Maurer*, AB Enzymes GmbH. New fungal endoglucanases were identified. *Sue Burn*, Croda Europe Ltd., developed "Cirrasol Expel: A New Stain Remover for Cleaner Clothes", which has been shown to be compatible with current concentrated laundry formulations and liquid-tab dosing systems. "Additives for Liquid Detergent Formulations for Enhanced Performance, Convenience and Care" were offered by *Severine Ferrieux*, The Dow Chemical Co. *Carmen Maria Pey*, Kao Corp. S.A., recommended "Levenol: Green Ingredient to Formulate Sustainable Home Care Products". Polyoxyethylene Glycerol Fatty Acid Esters (Levenol) are surfactants from vegetal origin, one hundred percent concentrated and with good eco-toxicological profile. In addition to their surfactant properties, they act as formulation aids. "Rapeseed Methyl Ester Ethoxylates: Nonionic Surfactants Based on Renewable, Central European Raw Materials" were presented by *C. Kolano* (together with *R. Richner. M. Sahebi* and *K. Holtin*), Kolb Distribution Ltd. Within the initiative to support the protection of fossil resources and to promote sustainability (Greenbentin product group) Greenbentin XES has been developed, which is based on Central European rapeseed methyl ester. *K. Holtin* (co-authors: *Carmen Hildebrand, S. Willi* and *C. Kolano*), Kolb Distribution Group Ltd., presented "Methyl Ester Ethoxylates: Hydrolysis Stability and Enzyme Compatibility". "Alcoguard HS 942: Hybrid Polymers for Cleaning. A Review on Performance, Biodegrability and Life Cycle Analysis" was delivered by *M. Davanzo* et al., Akzo Nobel Surface Chemistry AB. A second generation of hybrid polymers is based on a combination of naturally occurring polysaccharides and synthetic monomers. *Sophie Caminade* (together with *Marie-Françoise Chirac*), SEPPIC, recommended "Simulsol CL7 G, A New 100% Bio-based Short Chain Alkyl Polyglucoside". "Choosing Antifoam for Powdered Detergent" was the commitment of Wu Fei, Nanjing SIXIN Scientific Technological Application Research Institute Co., Ltd. *Maria de Morgas* (co-authors: *Núria Bonastre, Silvia Martinez* et al., BASF SE, highlighted "Beyond Softness: 3D Concept for Fabric Softeners" which is based on three physical senses: touch, sight and smell. "Washing Machine Cleaners: How Effective Are They Against Biofilm?" investigated *Caroline Amberg*, EMPA Testmaterials.

Colorants, Foam Structure, Dynamic Surface Tension, Fluorosurfactants

"Polymeric Colorants to Support Detergent Industry Trends for Differentiation, Compaction and Sustainability" were recommended by *L. de Bruyn*, Milliken Europe BVBA. Polymeric Liquitint colorants can be formulated for use in liquid and solid formulations and are suited to a wide pH range. *M. Snoyek* (together with *Marlitt Erbe*), Krüss GmbH, was committed to "Foam Structure Analysis: A New Technique to Evaluate Foam Structure and Foam Homogeneity". A new module to the Dynamic Foam Analyzer (DFA 100) has been introduced, which enables analysis of the foam structure *via* optical measurement of the foam and integrated image processing algorithms. *D. Miller*, Clariant Produkte Deutschland GmbH, asked, "Dynamic Surface Tension: Do Results from Different Laboratories Agree?" Interlaboratory tests were made with the maximum bubble pressure method, and a commercially available ethoxylate and with dodecyl trimethyl ammonium bromide (DTAB). At long bubble lifetimes, the surface tension approaches a quasi-equilibrium value. This region can be evaluated to give information on the surface tension kinetics.

"Fluorosurfactants on the Fast Lane: Excellent Balance of Product Performance and Ecotoxicological Impact" were presented by *J. Pahnke* (co-authors: *S. Schellenberger, G. Jonschker, R. Friedrich* et al.), Merck KGaA). A new range of fluorinated surfactants has been announced made from very short perfluoro chains (C_2–C_3), which show equivalent or even superior performance to existing longer chain products.

SEPAWA and European Detergents Conference 2014

Mark your calendar: The 61st SEPAWA Congress including the 10th European Detergents Conference (EDC) will take place on October 15th–17th, 2014, in the Esperanto Hotel & Congress Center, Fulda, Hesse. The focus of the 10th EDC will be on "Surfactants & Detergents: More than Cleaning Agents!?".

SEPAWA Innovation Cup

For the first time this year the SEPAWA decided to grant three Innovation Prizes for outstanding contributions in the field of cosmetics, detergents and perfumery.

Participators in this prize are companies who as exhibitors or with lecturers support the SEPAWA Congress. A neutral independent jury of 6 members from the scientific board of SEPAWA and of the chairman of SEPAWA selected 3 prize winners.

The First Prize gained the company Symrise, *Ev Süß*, for the active substance "SymSave" H, Multi-functional ingredient for cosmetic use". The Second Prize went to the company Provital Group, *Hagen Döring*, for the new active substance "Melavoid® – Effective skin lightening ingredient", and a further Second Prize went to Induchem Companies, *David Eggler*, for the new anti-aging combination "Neodermyl®, first double collagen and elastin booster".

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