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Community News

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Invitation to the SCS General Assembly 2024

The Board of Directors invites all members of the Swiss Chemical Society and the delegates of its associated societies to join the 34th General Assembly.
SCS General Assembly 2024
June 7, 2024, 13.30–14.00 (lunch breakof the SCS Spring Meeting 2024).
Biozentrum, University of Basel

Agenda GA 2024 (provisional)

1. Welcome and approval of the agenda
2. Election of the vote counters
3. Minutes of the 33rd General Assembly from April 14, 2023, (published in CHIMIA 5/2023, A357)
4. Annual Report 2023 (published in CHIMIA 1-2/2024)
5. Financial statement 2023 incl. audit report (a summary of thefinancial statement 2023 will be available for members on the website after theformal audit (login required))
6. Discharge the Board
7. Elections of board members. Election of the auditors.
8. News and strategic projects
9. Outlook 2024/2025
10. Varia

Motions to the assembly can be submitted until May 15, 2024 to *info@scg.ch*

Chemistry Europe Travel Grant: Researchers from Switzerland can apply in 2025

The Travel Exchange Grant, sponsored by Chemistry Europe, is an initiative fostering collaboration among promising young researchers and leading principal investigators in the European scientific community. This program aims to create impactful connections, facilitate laboratory visits, and promote knowledge exchange, while concurrently advancing Chemistry Europe's visibility among emerging talented chemists.

Chemistry Europe is an association of 16 chemical societies from 15 European Countries. Handled by chemists for chemistry, our role is to evaluate, publish, disseminate, and amplify the scientific excellence of chemistry researchers from around the world. We publish high-impact research on all aspects of chemistry and work from adjacent scientific areas that show chemistry's role as central science. We provide a scientific platform for original and inspirational work from across the discipline. Our mission is to support our members throughout their careers.

Objectives
Reinforcing research collaborations and connections, supporting the careers of young talented researchers

Facilitating Collaboration: The primary aim of the Travel Exchange Grant is to create a platform for young, talented researchers to reinforce connections with top-level principal investigators outside their country. The program intends to provide an opportunity for participants to gain exposure to joint research projects by visiting laboratories at the forefront of scientific research.

Professional Development: The initiative aims to equip the next generation with the skills and knowledge needed to excel in their scientific careers.

Who can apply?
The Travel Exchange Grant program is open to applications from researchers who meet the following eligibility criteria:

- Experience Level: Applicants must be researchers who are within 2-7 years from the date of obtaining their PhD degree.
- Publication Requirement: Applicants must have published at least one original article during the previous year as a reference author (first, corresponding, or last author) in one of the journals of the Chemistry Europe family.
- Membership: Applicants must be members in good standing and regularly registered in one of Chemistry Europe's partner societies.

In 2024, with the deadline of May 10, researchers from eight countries are eligible: Austria, Belgium, Czech Republic, Germany, Greece, Hungary, Italy, Netherlands

Switzerland will be in the 2025 round together with France, Poland, Portugal, Slovakia, Spain and Sweden, The call for applications will open in Q1/2025.
Source: *https://chemistry-europe.onlinelibrary.wiley.com*

A Warm Welcome to Our New Members!

Period: 27.02.2024–25.03.2024
Stefano Battaglia, Zurich - Melanda Bertrand-Avebe, Grand-Lancy - Silke Brenneisen, Basel - Elise Brou, Basel - Eylul Calikyilmaz, Basel - Hui Cao, Basel - Margarita Chalganova, Zurich - Samuel Chaves Gonçalvez, Geneva - Goncalo Clemente, Basel - Cristina

Lia Fernandez Regueiro, Bern - Pablo Gabriel, Huningue (FR) - Konrad Hedderick, Belmont (US) - Sebastien Jacquier, Habsheim (FR) - Ingrid Jeulin, Basel - Tetiana Khakhula, Geneva - Julie Lachal, Uffheim (FR) - Jessica Lanini, Basel - Zihan Li, Geneva - Luca Mantilli, Gamsen - Claudio Meyer, Basel - Marvin Muranko, St-Sulpice VD - Xavier Pellé, Basel - Catherine Rolando, Basel - Thomas Rossolini, Lugano - Lionel Rumpf, Echichens - Linda Sperandio, Basel - Erika Tassano, Basel - Claudia Tringali, Marly - Chloé Udressy, Dübendorf - Jean-Yves Wach, Basel - Xicheng Yuan, Carouge.

Honors, Awards, Appointments

SASP Erwin Schrödinger Gold Medal 2024 for Karl-Heinz Ernst, Empa, Dübendorf

Prof. Karl-Heinz Ernst, Empa – Swiss Federal Laboratories for Materials Science and Technology in Dübendorf, received the "SASP Award for Outstanding Scientific Achievements," in the form of the Erwin Schrödinger Gold Medal for his "pioneering studies and seminal contributions to fundamental and applied aspects of surface science, stereochemistry, chirality and nanomaterials" during the XXIV Symposium on Atomic, Cluster and Surface Physics in Andalo, Italy. The award designed by Zdenek Herman, was initiated in 1992.
Source: *https://chem.uzh.ch, https://www.empa.ch*

Prof. Peter R. Schreiner, Justus Liebig University Giessen (GER) receives the Heilbronner-Hückel Lectureship Award 2024

For his outstanding research in organocatalysis, nanodiamonds (diamondoids), novel carbenes and computational chemistry, the SCS and the German Chemical Society (GDCh) awards *Prof. Peter R. Schreiner*, Justus Liebig University Giessen, Germany, the Heilbronner-Hückel Lectureship Award 2024.

The Heilbronner-Hückel Lecture Series was implemented in 2009 with the first series in 2010 together with the Gesellschaft Deutscher Chemiker (GDCh). The annual series take place alternatively in Switzerland and Germany. The series is named after the chemists Edgar Heilbronner, born in Munich in 1921 and passed away in Herrliberg in 2006, and Erich Hückel, born in Berlin 1896 and died in Marburg in 1980. The lectures are planned as follows

- Monday, May 13, 2024, University of Bern
- Tuesday, May 14, 2024, ETH Zurich
- Wednesday, May 15, 2024, University of Basel
- Thursday, May 16, 2024, University of Geneva
- Friday, May 17, 2024, University of Zürich

Source: *https://scg.ch/heilbronner-hueckel*

Journal News

Helvetica, Volume 107, Issue 3, March 2024

Perspectives
Andrea Vasella and the Active Site of Glycoside Hydrolases
Roland Hoos-Michelotti

Synthetic Procedures
A Scalable and Chromatography-Free Synthesis of *N,N*-Bis(9,9-dimethyl-9*H*-fluoren-2-yl)-3′,3′,4′,7′-tetramethyl-2′,3′-dihydrospiro[fluorene-9,1′-indene]-2-amine, a new Hole Transport Material for Organic Solar Cells
Yves Aeschi, Thorsten M. Beck, Ulrich Berens, Alexander Ernst

Research Articles
Chiral Quaternary Ammonium Salt-Catalyzed Enantioselective Addition Reactions of Hydantoins
Katharina Röser, Lucas Prameshuber, Sajid Jahangir, Sharath Chandra Mallojjala, Jennifer S. Hirschi, Mario Waser

Enhancing the Metalating Power of $ZnEt_2$ via Formation of an Alkyl/Alkoxide Potassium Zincate
Jasmin Kocher, Neil R. Judge, Eva Hevia

Benzylic C(sp^3)–H Azidation: Copper vs Iron Catalysis
Angel Rentería-Gómez, Rubén O. Torres-Ochoa, Pierre Palamini, Raphaël Simonet-Davin, Qian Wang, Jérôme Waser, Jieping Zhu

Development of a Novel Measurement Setup to Study and Predict Electrostatic Discharges in Agitated Glass-Lined Vessels
Benedikt Robert Brönnimann, Daniel Egli-Tedesco, Klaus Schwenzfeuer, Andreas Zogg

Steric Bulk-Dependent Photoresponse of Sulfonamide Azobenzene Ligand in Arene Ruthenium(II) Complexes
Jonathan Long, Pascal Retailleau, Juan Xie, Nicolas Bogliotti

Website: *https://onlinelibrary.wiley.com/journal/15222675*

Industrial News

Source: *www.chemanager-online.com*

Sandoz Acquires Ophthalmology Franchise from Coherus

March 08, 2024: In a move to expand its ophthalmic platform, Sandoz, the former generics and biosimilars arm of Swiss drugmaker Novartis, has completed the acquisition of Coherus BioSciences' subsidiary Coherus Ophthalmology for $170 million. The deal, which adds the biosimilar Cimerli (ranibizumab-eqrn) to Sandoz's portfolio, includes a biologics license application, product inventory, ophthalmology sales and field reimbursement talent, as well as access to proprietary commercial software. Sandoz and Coherus entered into the transaction agreement in January 2024. Keren Haruvi, president Sandoz North America said: "Today we further expand the Sandoz biosimilar portfolio, while advancing our mission in the US of pioneering patient access to more affordable and much-needed medicines. With the addition of Cimerli to our existing ophthalmology franchise, we can now offer even more treatment options for US patients with vision impairment and loss." Cimerli, is an anti-VEGF therapy, is indicated for the

treatment of certain retinal diseases that, if left untreated, can cause vision loss.

Sasol Appoints Antje Gerber as New Chemicals EVP

March 13, 2024: Sasol has appointed Antje Gerber as executive vice president Chemicals and member of the group executive committee, effective April 15, 2024. She will succeed Brad Griffith, who is to retire on June 30, 2024. In her career, Gerber has held executive roles at several major chemicals players including Venator, HB Fuller and Evonik. From 2019 she was chief operating officer leading the Speciality Ingredients division at Lonza in Switzerland. After the division was sold and renamed Arxada in 2021, Gerber then served as its president of Speciality Product Solutions from 2021 to 2023. Since 2022, she has also been serving as a supervisory board member at German specialty chemicals company Altana.

AI-Powered Knowledge Transfer in Manufacturing

Harnessing AI to Access Valuable Organizational Knowledge with Smart Search March 20, 2024: Artificial intelligence (AI) can help companies in the process industry capture, retain and access valuable historical expertise and ease the transition for new colleagues in the plant. Bayer CropScience solved the challenging knowledge transfer with the AI-powered module Smart Search. The module is part of the Plant Process Management (PPM) solution Shiftconnector by the global software provider Eschbach. "Knowledge transfer is a big issue in shift operations," explains Matthias Heskamp, former Head of Site Operations and Excellence at Bayer CropScience in Muttenz, Switzerland. "In a 24/7 plant operation, data is generated around the clock. That's 168 hours per week. Day operations teams, responsible for coordinating problem solving, only work 40 hours per week, but need to access information that is generated 24/7." The responsibility of keeping all manufacturing processes up and running depends on the collaboration of many stakeholders in various departments, including engineering, board and field operations, research and development, maintenance, and plant management. Several years ago, Bayer CropScience implemented Shiftconnector as a PPM solution to improve communication and information transfer across shifts, departments, and different levels of hierarchies. The PPM solution gathers data generated by users, such as shift notes, logs, and observations, as well as automated data retrieved from sensors. In doing so, machine data receives relevant context, which serves as crucial background information, shows the full picture of specific plant operations, and is important for decision-making when process upsets occur. Bayer CropScience is further optimizing its production with a new AI-based module.

Process-Relevant Information Meets AI

Important best practices and experiences that go beyond the knowledge documented in writing, i.e. explicitly in training documents or standard operating procedures (SOPs), often remain hidden in the minds of employees. As soon as those workers leave the company, relevant knowledge might be lost. Day operations teams need exactly this implicit know-how to evaluate the production processes and make the right decisions in cases of events and process upsets. With Shiftconnector, manufacturing teams generate vast volumes of information in every single shift, and all these inputs have become a huge repository of historical knowledge. Mining this big and valuable source of expertise can help shift teams discover opportunities for continuous improvement, learn from prior mistakes, and find solutions for recurring problems. That's where AI comes in. AI-driven applications can quickly browse through large volumes of data to identify patterns and surface insights that would be difficult or impossible for humans to discern within a reasonable timeframe. National language processing (NLP), a specific area of AI, enables the system to process queries and instructions provided in plain language, derive meaningful information from text-based sources, and return results that humans can understand.

Custom-Oriented Design

Process-relevant information that is processed with a smart application offers an opportunity for greater efficiency and safety in manufacturing. AI also makes it possible to collect implicit knowledge to make employees' experiences available for future generations. Capturing and managing knowledge is domain-specific, which is why Smart Search is designed with customers in mind. The software provider worked closely with Bayer CropScience and the University of Göttingen to develop the AI-driven module. "In the field of NLP, applications such as chatbots already work very well for common conversations, but specialized domains, such as the chemical and pharmaceutical process industries, need solutions tailored to their exact needs," explains Bela Gipp, professor at the University of Göttingen. "Key to the success of this project was the close collaboration with the customer from the very beginning to understand their specific use cases, jargon and pain points." Using NLP, Smart Search can comprehend the meaning and context of a query to surface the most relevant results. In addition to filtering stored information, the module can process communications by cataloging and indexing topics, keywords, phrases and more. This far surpasses what we know from internet search engines. The tool provides exclusive plant insights, and, in the event of disruptions, delivers solutions that have already been proven to work.

From Ideation to Implementation

Smart Search at Bayer CropScience was taken from ideation to implementation within only two years, and long before AI consumer apps like ChatGPT went viral. It was built using industry- and plant-specific terminology, data formats and information provided by process engineers, board operators and shift leaders during workshops and onsite investigations. The result is an AI-infused system that is highly customized to the client's workflows, language, and requirements. Workers can now quickly uncover the information they need to perform their jobs more effectively. For example, if a problem develops at a particular point in a process, they can simply submit a query such as 'Dark color of product?' to easily identify any previous instances of the problem and what was done to resolve it. "Smart Search has reduced the amount of time our employees spend searching for relevant information, often from several hours to mere minutes," Heskamp adds. "AI helps our employees to work as efficiently as possible." This enables faster troubleshooting, facilitates problem resolution, and improves plant performance. Smart Search has transformed Bayer's Shiftconnector installation from an information repository and standard shift communication system to a future-proof, intelligent knowledge hub. Workers at Bayer can quickly scan a decade of information to find what they need at any moment. This means that the wisdom and lessons of the past are stored and readily available for workers today and tomorrow. It can be integrated into any Shiftconnector installation based on Eschbach's cloud and adapted to the precise needs on-site.

Next-Generation Knowledge Management Platform

Looking forward, knowledge management will be essential to helping process manufacturers adapt to new workforce realities. In 2021, the German Institute for Employment Research (Institut für Arbeitsmarkt- und Berufsforschung) predicted that, statistically speaking, around 15% of people in employment

will disappear from the German labor market by 2030. A knowledge management platform with AI can help companies retain valuable tacit knowledge from experienced operators, technicians and engineers and make it accessible for the coming generation. Over the next few years, Shiftconnector will provide increasingly diversified AI-based applications, including features that may help users understand search results faster by providing a meaningful classification of results and offering complete text-based instructions for troubleshooting. Maximizing the effectiveness of younger, less experienced shift teams using Smart Search will help companies address the skill gap and get more done with a smaller workforce. Eschbach's aim is to increase efficiency in the process industry, boost productivity, and ultimately ensure a seamless transfer of knowledge.

Sustainability in Production is Key – What Does Flow Chemistry Bring to the Table?

Micro or Milli Reaction Technology Could Be a Powerful Ally in Achieving the 12 Principles of Green Chemistry

March 20, 2024: Numerous articles have been published within the last years in chemical science and business media (including this one) on the advantages of continuous reactions, aka flow chemistry. While the innovative technology has long since outgrown its infancy, it is still struggling to find widespread use outside of laboratories and technical centers. Now, with sustainability being named everywhere as the new guiding light for the industry, a paradigm shift from batch to flow reactions is likely to happen. Or isn't it? Over the course of at least a decade, flow chemistry has been praised in many headlines as a promising standard technology for production in the chemical and pharmaceutical industries and as a driver of sustainability. "Flow Chemistry Opens up New Possibilities", "A Technology on the Upswing", "Unique Opportunity for Innovation and Improvement", "Key Technology for Sustainable Processes", "A Mature Technology still on the Rise" – just to mention a few of them. Undoubtedly, flow chemistry, also known as microreaction or millireaction technology, does have several advantages for chemical and pharmaceutical production, and all of them have a sustainability component, be it safety, resource and energy efficiency, product quality, selectivity or flexibility.

Pros and Cons

The advantages of flow chemistry are fast and good mixing and excellent heat transfer, enabling higher selectivity and yields while lowering raw material requirements. Besides, the number of by-products and the energy demand for their separation (downstream processing) is reduced – about 70% of energy costs correspond to the separation of by-products. Regarding safety, fast, explosive, and highly exothermic reactions involving toxic substances can be run in much smaller reactor volumes than batch reactors. "Continuous flow technology can improve the robustness, sustainability and safety of many chemical processes. It is an enabling technology that allows the safe generation and use of hazardous intermediates, as well as operation under high temperatures and pressures," explains David Cantillo, flow chemistry expert and area leader at the Research Center Pharmaceutical Engineering (RCPE) at the University of Graz, Austria. Thus, the contribution of flow chemistry for designing chemical processes with a lower environmental footprint compared to batch production stimulates justified hope for society's need of a greener, more sustainable and safer chemical industry. Various aspects of flow chemistry also support the design of novel strategies for the transformation from an exclusively fossil-based to a biobased industry, or at least to a more sustainable chemical industry, with applications ranging from commodity to specialty chemicals to fine chemicals, including agrochemical and pharmaceutical intermediates and active ingredients. However, on the flip side, there are challenges and limitations that hamper a broader application of flow reactors in industry that may explain why flow chemistry is still not as common in chemical and pharmaceutical production as it should be, given its benefits. During a recent roundtable discussion on the topic of sustainability in chemical and pharmaceutical production organized by CHEManager, participants from several manufacturers as well as service and technology providers shared their views on flow chemistry. One key finding from this discussion may not come as a surprise: Safety, and not sustainability considerations are still the most important, if not — as for many manufacturers — the only criteria when deciding to run a reaction in a flow reactor. Microreaction technology can improve the safety profile of a reaction, as hazardous and reactive reagents can be handled more safely and highly exothermic chemistry can be better controlled in a microreactor (or millireactor, depending on the tube diameter) due to smaller volumes and to higher heat and mass transfer. Peter Markus, Senior Director Marketing & Sales / Key Account Management at Midas Pharma and a chemist with 30-years industry experience, explains: "The motivation was always safety. Flow processes have been used for hazard-driven chemistry, because the reaction mixture could be reduced to small volumes at the moment of flow, hence less risk of damage in case of an event." Annegret Vester, Chief Sustainability Officer of German chemical company CHT, and a chemist whose vision is a sustainable future for the chemical industry, regards safety as one significant aspect of sustainability. "We have established microreaction technology in Germany for many years for the production of H-siloxanes, i.e. organosiloxanes with Si-bonded hydrogen atoms, and it works excellently. For siloxanes, the introduction of microreaction technology had a clear focus on occupational safety. We thought that we could do a lot more with flow chemistry, but we had to recognize that our large and diverse portfolio of products and technologies is more suitable for batch processes because for flow processes you need a certain throughput. If you have a large-volume product, flow chemistry is unbeatable, it's actually more sustainable than batch production. With 5,000 products in our portfolio, you can imagine that they do not all run on a large scale, but there are a lot of product changes every day." Sustainability in general is not necessarily seen as top priority for choosing a chemical manufacturing process, but any improvement of occupational safety or process efficiency automatically enhances the sustainability performance of a process. Indeed, most large-volume processes use continuous reactions due to the efficiency benefits. At a smaller scale — maybe even at a scale of about 10,000 t/a — batch reactors dominate as establishing a continuous process is expensive and requires a substantial upfront investment that can only be justified when the production scale is large. Vester's statement is congruent with others. For instance, Daniel Wagner, Head of CMC Synthetics Early Development Germany at Sanofi, said: "When it comes to flow chemistry, sustainability is not the only important aspect for us, key is also the advantage to accelerate the scale-up from smaller to larger batch sizes." And Ulrich Mayerhoeffer, Head Technical Evaluation and Development at Swiss Contract Development and Manufacturing Organization (CDMO) Arxada, told CHEManager in a previous survey: "We are strong believers in the benefits of flow chemistry." But he admits that technology selection is mainly driven by process safety, quality, sustainability, and overall economic considerations, with safety as the strongest driver towards a flow process. Although advantages in terms of process parameter control are often also beneficial product quality-wise and the strengths of flow chemistry are clearly demonstrated in reactions where the control of side product formation or the preservation of stereo-information are vital. The CDMO space in pharmaceuticals and fine chemicals is still dominated

by batch and semi-batch processes performed in multipurpose plants. But why are benefits like product quality, control of side product formation or preservation of stereo-information not enough reason to switch from batch to flow? Especially in the pharma or agrochemical sector, where many products require multistep syntheses, that could be performed in sequence or in parallel by connecting different flow reactors?

Hurdles to Overcome

The reasons for the hesitancy of many manufacturers to adopt microreaction technology can be manifold, including, as mentioned above, the high initial investment for the flow equipment and infrastructure, but also the lack of standardization and compatibility among different flow systems and components, or the lack of expertise and training among chemists and engineers. This applies in particular to new processes for which there is no comparison with batch processes, and, in addition, it usually takes several years for new technologies to find their way into standard educational literature.

Another aspect that is particularly significant in the pharmaceutical sector is the high level of regulation. The development and approval of a synthesis process for pharmaceutical chemicals by the regulatory authorities is a lengthy and costly process. Many companies are therefore reluctant to replace an established and audited process with a new one. According to Kai Rossen, Chief Scientific Officer at EuroAPI, the former CDMO business of Sanofi, the regulatory context with its strong impact on the quality of the products as well as the responsible control of waste streams is important. Rossen said: "The last 20 years have shown a re-discovery of flow chemistry. The application of flow chemistry enables reactions that could not be performed in a simple batch process and are thus a critical tool in finding the optimum for the synthesis of a compound, such as an API." In addition, batch processes in dedicated or in multipurpose reactors have been optimized in many areas to such an extent that they no longer have any significant disadvantages in terms of efficiency and sustainability compared to flow processes. Ulrich Scholz, Head of Chemical Development at Boehringer Ingelheim Pharma, described one such experience: "We tried to show that flow chemistry is superior. We had several examples, but in the end realized that although the flow process works well, the batch process is not much worse or even got better with a catalytic upgrade."

But the adoption of continuous flow technologies for pharmaceutical applications is now strongly advocated by regulatory authorities such as the US Food and Drug Administration (FDA) and the European Medicines Agency (EMA). This may lead to faster regulatory approval which could lead to quicker adoption of flow processes for the manufacture of pharmaceutical chemicals. One reason for the hesitancy to implement flow technology may simply be the resistance to change. Thomas Riermeier, Senior Vice President & General Manager, Health Care at Evonik, said: "We invested in flow chemistry years ago and built a modular pilot plant. As a CDMO company, Evonik had evaluated the technology for customer projects, and we've seen an increasing customer interest in more sustainable solutions. But as of now, a real breakthrough is yet to occur." According to Riermeier, the decisive factor was that customers preferred the established process at that time. For Riermeier, it is not a black and white decision, but the crucial success factor is: "How can we expand our chemistry toolbox making processes as efficient as possible? I believe, we have to face it with an open-minded setup towards technologies – if continuous flow, or classic batch – and by doing so favor those with the most positive sustainable impact." A risk-averse mindset may predominate particularly among seasoned chemists who have not been educated or trained in this technology. Although flow chemistry is not a novel technique and many of the top commodity chemicals by volume are produced in continuous plants, fine chemicals and pharmaceuticals production are still almost exclusively dominated by batch manufacturing. So, as the lack of know-how in the field and the late adoption of the technology are perceived as major hurdles, general education and proper training in flow chemistry in the early chemistry curricula would contribute to a more widespread technology transfer and faster adoption. An indicator of the technology's maturity status is recent job offers from the pharmaceutical industry, where skills in flow chemistry are often required. However, these challenges and limitations are being addressed by ongoing research and development

Silver Linings

Flow chemistry can be considered a green technology because flow reactions can be performed in a sustainable way, with advantages for safety, efficiency, waste reduction, the avoidance of hazardous chemicals, continuous product formation, and easy recovery and reuse of the catalyst. It, therefore, could be a powerful ally in achieving the 12 Principles of Green Chemistry. Significant efforts have been made globally to develop the manufacturing flexibility and robustness of processes used to produce chemicals in a continuous way. Andreas Foerster, managing director of Dechema — the German Society for Chemical Engineering and Biotechnology — explains: "Since the early research in microreaction engineering the field has evolved and diversified. Millimeter instead of micrometer structures are more often used in continuous production equipment today. Such channels sufficiently provide the advantages of microreactors while being more robust for example in the handling of solids, which remains challenging in microstructures." Förster adds: "In this sense, microreactors are used in production processes in the form of modular continuous production units or flow chemistry set-ups containing such structured devices."

Yet, despite these developments, a major challenge for the fine chemical and pharmaceutical industry is the established application of flow technology to commercially relevant examples. The identification of opportunities to apply micro or millireactors to current processes is critical to the success of this technology for pharmaceutical and fine chemical companies. There are, however, examples that may indicate that flow chemistry is really a technology on the upswing and may proceed faster than expected. For instance, in the spring of 2023, Italian CDMO Flamma Group announced to invest $200 million over the next three years to expand its capabilities and add innovative technologies which will include expanding its existing flow chemistry capabilities in Italy. And in summer of 2023, Axplora, a pharmaceutical CDMO established previously by the merger of German CDMO PharmaZell and French CDMO Novasep, said that it has completed the installation of a new cGMP flow chemistry pilot unit at its German site in Leverkusen, costing more than €1 million. Axplora, a partner of pharmaceutical and biotech companies for the production of complex active pharmaceutical ingredients (APIs), sees special technologies like flow chemistry as a differentiating factor. Ester Masllorens, Chief Technology Officer of Axplora, explains: "Continuous processing is a key enabling technology for the future of pharmaceutical manufacturing, strongly supported by regulatory bodies such as the FDA. This technology has high potential to enhance sustainability, improve control and quality as well as reduce costs and time to market."

Conclusion

The decision for or against it falls within a narrow range of criteria and parameters that have to be fulfilled in order to make technical and economic sense for manufacturers of chemicals and pharmaceuticals. Flow chemistry is not a one-size-fits-all technology, but it is an innovative, yet matured technology that offers numerous advantages and benefits to transform chemical production in a sustainable way. Hence, flow chemistry in pharmaceuticals and fine chemicals manufacturing is gaining momentum, however, it will not prevail rapidly but rather in a step-by-step kind of marathon walk with twists and turns along its way. As a new generation of chemists and managers is eager to embrace green and sustainable chemistry – especially in new processes – the long-term prospects are clear: Flow chemistry is here to stay.

Lonza Buys Biologics Plant From Roche for $1.2 Billion

Genentech Production Facility in Vacaville, California, Expands Production Network in the USA March 21, 2024: Lonza has signed an agreement to acquire Genentech's biologics manufacturing site in Vacaville, California (USA) from Roche. The Swiss pharmaceutical company announced plans to sell the site in May 2023. The €1.1 billion ($1.2 billion) acquisition of Genentech's manufacturing facility in Vacaville, California, will significantly increase Lonza's large-scale biologics manufacturing capacity. This will enable the Swiss CDMO (contract development and manufacturing organization) to meet the demand for commercial contract manufacturing of mammalian cell culture antibodies from customers with existing commercial products as well as molecules on the path to commercialization within the Lonza network. Located between San Francisco and Sacramento, the facility currently has a total bioreactor capacity of approximately 330,000 liters, making it one of the largest biologics manufacturing facilities in the world. Under the terms of the agreement, Lonza will offer employment to approximately 750 Genentech employees at the Vacaville facility. The acquisition, which is expected to be completed in the second half of the year, is expected to boost the Basel-based group's sales. Lonza has raised its growth forecast for the period 2024-2028 from 11-13% to 12-15%. Demand for commercial biologics capacity is expected to remain high across the CDMO industry. The acquisition of the Vacaville site expands Lonza's presence in the US and complements Lonza's biologics site in Portsmouth on the East Coast and its international network in Europe and Asia. Lonza plans to invest approximately €513 million (CHF 500 million) to upgrade and expand capacity at the Vacaville site. The products currently manufactured at the Roche site will be supplied by Lonza with a medium-term volume commitment that will be phased out over time as the site transitions to other customers.