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News



**The gateway to
China's process industries**



ACHEMASIA 2010

Beijing, PR China, 1-4 June 2010

A special edition from
PROCESS
DESIGN • OPERATION • MAINTENANCE



Real answers **from the real world**

The economic worries of the past months have not only been an economic setback, but they have also overshadowed some very important and urgent discussions. Climate change, the necessity of feeding an increasing global population, the need for new and sustainable resources are still unsolved questions, and they will not be answered by financial experts. They need to be taken on by the real economy, by scientists and engineers working on tangible solutions instead of virtual assets.

Many issues that are currently discussed in television talkshows and political boards have a strong technical aspect: Can and should CO₂ be separated from exhaust streams and stored in underground cavities? Could microalgae act as CO₂ sinks or provide renewable resources on an industrial scale? In the public sphere, topics like these are often discussed without regard to basic technical facts. Our responsibility as scientists, as researchers, developers and as responsible businessmen is to raise our voice clearly and early and put political and public discussions on a firm scientific and technical basis. But in order to be listened to, we have to engage in an open exchange with society and politicians as to define what is meaningful and achievable rather than following illusions.

If we pursue this goal, it should have a significant effect on political processes: With a common foundation of facts, discussions should become more objective and targeted. Of course, there is still much room for ethical disagreement and political controversy. But some long-winding and expensive detours might be avoided or at least shortened. Take biofuels as an example: True, scientists and engineers were the first ones to advocate first generation biofuels. But they were also the first ones to see the limits of this model and to turn the wheel. Now, researchers and companies are focussing on second generation biofuels that are primarily based on waste streams. Currently, the political world takes the new findings up and reacts. I believe that this proc-

ess has been significantly accelerated by the scientific boards that expressed their concerns to the general public clearly and with the admission that their initial euphoria had been too hasty.

It has always been a goal of DECHEMA to provide decision-makers with the necessary scientific and technical knowledge combined with economic and ecologic borderlines. We have offered a platform for well-founded discussions in the past, for example on green biotechnology at ACHEMA 2009, and we will continue and extend these activities in the future. At the same time, we are aware that many of today's issues are highly complex, requiring the close cooperation between disciplines, industry and science and across national borders. We have taken this into account by increasing the cooperation with other institutions and organisations. The most striking example is certainly ProcessNet, the common platform uniting the chemical and process engineering activities of DECHEMA and VDI-GVC. But also many other expert bodies, events and publications, whether on energy supply, biotransformations or coal chemistry, are organized by DECHEMA in cooperation with appropriate partners, exploiting synergies and unifying strenghts. We believe that as many issues we are facing today are multi-faceted and international, the answers lie in multi-faceted and international initiatives.

It is essential to have the uprising new economies participating in these efforts. AchemAsia 2010 in Beijing will be an outstanding opportunity to pass our commitment on to the global community, to extend and strengthen the international network of experts and innovators and to show the world that the "real economy" offers real opportunities.

Dr. Hans-Jürgen Wernicke
Deputy Chairman of Süd-Chemie AG
and designated DECHEMA Chairman



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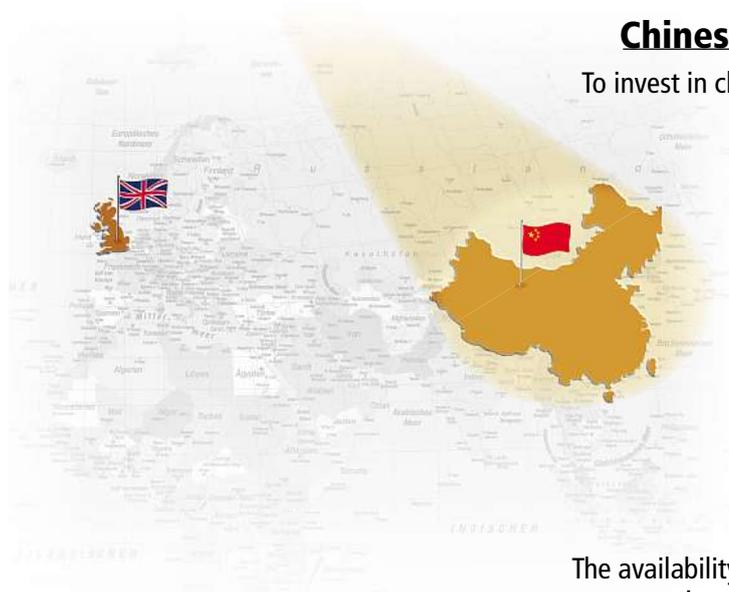
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ACHEMA 2009: the world chemical engineering summit generates optimism

Upbeat mood

Chemistry and chemical engineering are focusing confidently on the future: this sums up ACHEMA 2009. On five days over 173,000 visitors from all over the world visited the 3,767 exhibitors in the exhibition halls in order to catch up on the latest products and technologies from chemical engineering, biotechnology, environmental protection and adjacent sectors. Companies, institutes and research institutions displayed their cutting-edge developments from chemical engineering, pharmaceutical and food technology, biotechnology and related sectors over an area of 134,000 m². Here, development engineers and plant designers could find everything they needed, from a single gasket to a complete refinery concept. Moreover, in terms of exhibitors and visitors the 29th ACHEMA was more international than ever before. 46.6% of the exhibitors and 25% of the visitors came from abroad.

But it was not only the figures that added up: the exhibitors unanimously praised the high standard of discussions and contacts. There was little hint of crisis at the stands and in the halls – “Everyone’s waiting for someone to press the Start button and then it will be all systems go,” is how one exhibitor described the prevailing mood. Experience shows that around 50% of all contacts made at ACHEMA lead to cooperations.



There was little hint of crisis at the stands.



During ACHEMA 15 companies were honoured for their 25th participation.



One particular attraction was the panel discussion on “Genetic engineering for agriculture”, featuring the former Federal Environment Minister Sigmar Gabriel and BASF Executive Director Stefan Marcinowski.



The ACHEMA Congress was well attended. The 900 lectures attracted scientists and developers to the lecture rooms to discuss the latest market-ready research results.



“ACHEMA is a showcase”

Interview with Dieter Grabenbauer, Executive Vice President of Lurgi GmbH

Mr. Grabenbauer, what is your impression of ACHEMA 2009?

GRABENBAUER

My impression is very positive. We see a lively stream of visitors at our booth and are very pleased with the keen interest. This sets a positive signal, especially as the visitor quality is very good as well. The offering of German plant engineering is internationally highly relevant. The question is: What can German technology offer with regard to the global challenges? For Lurgi, the answer is for example to contribute to the wellbeing of the planet by enabling the efficient processing of resources.

What characterizes ACHEMA?

GRABENBAUER

ACHEMA is a showcase – an industry introduces itself. ACHEMA is a presentation platform and offers the opportunity to gather preliminary information. This is the basis for further and more intensive contacts.

What does ACHEMA offer to the visitors?

GRABENBAUER

For visitors, it is essential that the distances are short while they can still see the whole portfolio. They can talk to representatives of a range of technical solutions. The students that visit ACHEMA are in turn very interesting for the exhibitors: we get the chance to position ourselves as employers.

This year's overriding theme was process efficiency, i.e. the efficient use of energy and raw materials. Biotechnological processes and the application of renewable resources were also key topics. Many exhibitors displayed novel microstructured components, while nan-

otechnology and ionic fluids played a prominent role in the Congress programme.

Conclusion: Evidently the expectations were once again fulfilled in 2009, for over 85% of visitors evaluated the quality of ACHEMA positively. ■



The 8th AchemAsia will take place from 1–4 June 2010 in Beijing. The International Exhibition-Congress on Chemical Engineering and Biotechnology has established itself as the flagship event for the chemical process industries in China and the whole of Asia.

AchemAsia 2010

— a new era in new surroundings

— DR. THOMAS SCHEURING —

Twenty years are a long time, and indeed a lot has happened since the first AchemAsia in October 1989. DECHEMA is certainly proud to have navigated AchemAsia through some turbulences in these times. By now, ACHEMA's Chinese daughter is firmly established in South East Asia's event calendar. Throughout the years AchemAsia's trademarks always have been continuity and reliability. Long established relations with DECHEMA's supporting institutions; the credo that it

The author is Head of Exhibition Congresses, DECHEMA e.V.,
e-mail: scheuring@dechema.de

needs stamina to succeed in China; perseverance and networking – these are the key factors which have contributed to the positive development. With several new exhibition venues becoming additionally available in Beijing as a side effect of the 2008 Olympics, it is now the time to open up a new chapter in the AchemAsia screen-play. The all new China National Convention Centre (CNCC), the new venue for AchemAsia 2010, is about to set standards for exhibition venues in China and will certainly give a strong boost to the upcoming 8th AchemAsia. Centrally located and directly adjacent to the Olympic Park, the new venue possesses state-of-the-art facilities and is easily accessible by public transport. Its smart hall layout will definitely offer AchemAsia the long-awaited opportunity for a further positive development. Previous restrictions only too



Pictures: DECHEMA



New venue for AchemAsia: The China National Convention Centre (CNCC, on the left), centrally located and directly adjacent to the Olympic Park (shown above the famous "bird's nest"), possesses state-of-the-art facilities.

familiar to regular exhibitors will be a story of the past.

While the world economy is still affected, China's current economic situation as well as its outlook for the foreseeable future represents a glimpse of light at the end of the tunnel. The timing of AchemAsia 2010 insofar seems to be quite excellent as many of our target groups pin their expectations on a speedy recovery of the Chinese economy. China itself has set up a huge investment program to support its domestic demand and to sustain the still remarkable growth rates.

Especially noteworthy for our industry branches is the very substantial investment program for the petrochemical sector. In January 2009 the Chinese government announced a 500 billion RMB stimulus package for the petrochemical industry. This package includes an investment of 400 billion RMB for the construction of 20 new large scale petrochemical projects. China's two leading petrochemical companies, CNPC (China National Petroleum Corp.)

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and SINOPEC (China PetroChemical Corp.) will be the main beneficiaries of the stimulus package, with both of them accelerating their pace in building new large-scale manufacturing facilities.

What else is new for the 8th AchemAsia? Triggered by the improved exhibition environment as well as by exhibitors' requests, rental tariffs have been readjusted, aiming at a fair and overall more customer-friendly system with enhanced transparency. While the basic price level remains unchanged, this new graded tariff offers exhibitors various options for a wide range of budgets. It is now based solely on the attractiveness of the actual booth location rather than the exhibitor's country of origin, which used to be the reference point for rental fees.

Responding to the preference of nearly all exhibitors for a more compact event format, exhibition dates have been shortened to a four day schedule, with the first and last day actually being half exhibition days only. This helps to save costs on the part of the exhibitors, and it reduces unwanted absence time from their regular duties for the exhibitors' staff.

Needless to say, the new venue will also improve the set-up for the accompanying AchemAsia conference which once again will feature dozens of interesting contributions from a broad variety of hot topics. ■

Chinese *chemical design* institutes

To invest in chemical projects in China needs help from local contractors

— JENNIFER XIE —

Generally, the approval of chemical projects built in China needs related engineering qualifications issued by the Chinese government, which requires the participation of Chinese engineering companies with required certifications. Virtually all of the companies are subsidiaries of state-owned enterprises and most of them have been restructured from design institutes in the planned economy era. Some of the companies have been recognized by overseas competitors for their planning capacity during pre-project phase.

The Chinese chemical design institutes took charge of design tasks for state-invested chemical projects, holding years of experience in conceptual design and basic engineering design of large-scale petrochemical projects. The director of process and engineering of one German company shared his experience in their cooperation with Chinese engineering companies (originated from chemical institutes), that Chinese partners could complete the in-depth design during pre-project period, reducing risks in project development and making cost accounting more reliable. However, they seem to lack experience in engineering and are not open enough to employers' proposals. Their handling of related criterions also need to be improved, as mistakes like choosing obviously larger pipes regularly happen. Though most projects are finally accomplished, they are evidently not the right partners to shoulder detailed engineering design.

J. Xie, Shanghai Sower Mechanical & Electrical Equipment Co., Ltd.

In fact, there is much space for improvement for most state-owned EPC engineering companies regarding engineering design, particularly detailed engineering design. This is largely because these Soviet type companies hold a different development route with the western EPC companies. These companies need to learn more field experience and equipment know-how as the contractor or engineering company. And what the western investors demand is a partner with profound understanding of local worksite and process equipment.

In this instance, detailed engineering design, equipment procurement, installation and civil construction require more participation of Chinese local process equipment manufacturers. In their routine business activities, they will accumulate experience and capacities concerning technical communication, equipment design, pipeline design as well as the procurement, installation and commissioning of process equipment. For most western investors, a contractor with equipment manufacture know-how and multi-national exposure and sensitivity is the partner they need. Sower (Shanghai) is such a ideal partner, from making mixing vessels and reactors to the output of chemical production lines, it has gone through a natural process of growth.

The growing up of small and medium EPC companies

The Chinese small and medium EPC companies will play a more active part in the near future, since overseas investors in China's fine chemicals industry have been increasing. For one thing, the domestic fine and specialty chemicals markets are rapidly growing; for another, with the profit in the petrochemical field, more multi-national chemical groups expect success in

Investment diversion to developing countries as China has been an efficient cost-cutting method for multi-national chemical groups. At the same time, the Chinese small and medium contractors developed from chemical equipment manufacturers will provide the help needed adapting to this change.

Picture: BASF

Table: some engineering companies restructured from chemical design institutes

Company name	Name of origin	Site
Chian Tianchen Engineering Corp.	No.1 Design Institute of the Ministry of Chemical Industry	Tianjin
China Huanqiu Contracting & Engineering Corp.	No.1 Design Institute of the Ministry of Chemical Industry	Beijing
Sedin Engineering Co., Ltd.	No.2 Design Institute of the Ministry of Chemical Industry	Taiyuan, Shanxi Province
East China Engineering Science and Technology Co., Ltd.	No.3 Design Institute of the Ministry of Chemical Industry	Hefei, Anhui Province
Wuhuan Engineering Co., Ltd.	No.4 Design Institute of the Ministry of Chemical Industry	Wuhan, Hubei Province
Sinopec Ningbo Engineering Co., Ltd.	No.5 Design Institute of the Ministry of Chemical Industry	Ningbo, Zhejiang Province
Hualu Engineering and Technology Co., Ltd.	No.6 Design Institute of the Ministry of Chemical Industry	Xi'an, Shanxi Province
Sinopec Nanjing Design Institute	No.7 Design Institute of the Ministry of Chemical Industry	Nanjing, Jiangsu Province
China Chengda Engineering Co., Ltd.	No.8 Design Institute of the Ministry of Chemical Industry	Chengdu, Sichuan Province
Sinopec Shanghai Engineering Co., Ltd.	Shanghai Pharmaceutical Industry Design Institute	Shanghai

more industries. China's jointly funded plants on chemicals as coatings, inks, pharmaceuticals, additives, cosmetics and pesticides are keeping growing, and it is more practicable to assign these chemical projects to small and medium EPC companies with abundant experience in the above fields.

Currently, these small and medium EPC companies generally take part in detailed engineering design, procurement and construction during middle and late project stage. Hence the primary evaluation criteria for them shall be the experience and capacity on process equipment. The overseas companies face some critical problems: how can the production of equipment and machinery become more efficient? How can production and equipment cost be reduced? Behaviors as multi-phase optimization and equipment redesign can bring significant cost reduction. The small and medium contractors hold an open attitude and flexibility toward such modifications, and they are more willing to make refinements according to customers' specific requirements.

The western investors always complain that the list of the Chinese construction corps vary frequently, and contractors' construction management are in question. Another

important criteria is the international technical communication ability and the experience in international trading. Chinese partners' knowledge of English still remains a balk, they have difficulty in prompt understanding of employers' requirements. And the lack of international trading experience may result in improper use of overseas standards, and equipment security and eco-friendliness cannot be fully guaranteed. Companies with years' multi-national trading experience are more competitive on aspects mentioned above. They have paid for some common defects of the Chinese companies and will have a stronger aspiration to improve.

Multi-national companies should cherish confidence with their future career in China. It is necessary (and possible) for them to select and cultivate local EPC companies to act as the general contractor, subcontractor, engineering design company or construction company of their projects in China. With the joint effort, localization could be achieved in more depth, and the dispatch of high-tech equipment and technicians will decrease gradually. As a result, the expected cost-cutting will appear on investors' year end financial statements other than market analysis reports and industry reviews. ■

hybrid rice research, stem cell and cloning technology, gene therapy and drug/vaccine development.

Industrial biotechnology – encompassing the use of enzymes, micro-organisms, or renewable resources and conventional chemical processing, to manufacture liquid fuels and chemicals – is of growing importance in China, as in many countries, because of its technical, economic and environmental advantages.

China's use of industrial biotechnology in its biofuels and chemical industries has led to its position as the world's third-largest producer of ethanol and second-largest producer of chemicals. State-owned entities as well as new domestic and foreign private companies are investing significant amounts in renewable energy, liquid biofuels and production of bio-based chemicals, with several large biodiesel plants expected to come onstream in the next five to seven years.

In the chemical industry, bioprocesses are used with or instead of conventional chemical processes to produce products ranging from biodegradable biopolymers to specialty chemicals and pharmaceuticals. China's chemical industry is making increasing use of industrial biotechnology to manufacture enzymes, starches and

sweeteners, citric acid, lactic acid, xanthan gum, vitamin C and bioplastics, as well as many other chemicals. Production of biopolymers, mainly PHA and PLA, is also increasing, with most of the output currently exported. Production and marketing of bio-based chemical products is open to foreign firms, presenting significant opportunities for investment.

Gateway to opportunities in China

Taking place near Beijing's Olympic park, AchemAsia 2010 will be Asia's leading event for the process industries. It will provide access to Chinese industrialists and decision-makers and be an excellent chance to showcase innovations and recruit new personnel. With the exhibition profile and congress topics focusing on China's core industries and current trends, such as sustainable production, AchemAsia participants will learn first-hand about present technological demand. A serious commitment in China needs to be part of the long-term strategy of any UK business. Whether a company is new to China or already building successful partnerships there, AchemAsia should certainly be on the agenda for June 2010. ■



And the winner is...

...the black gold: coal is the current champion of China's chemical industry

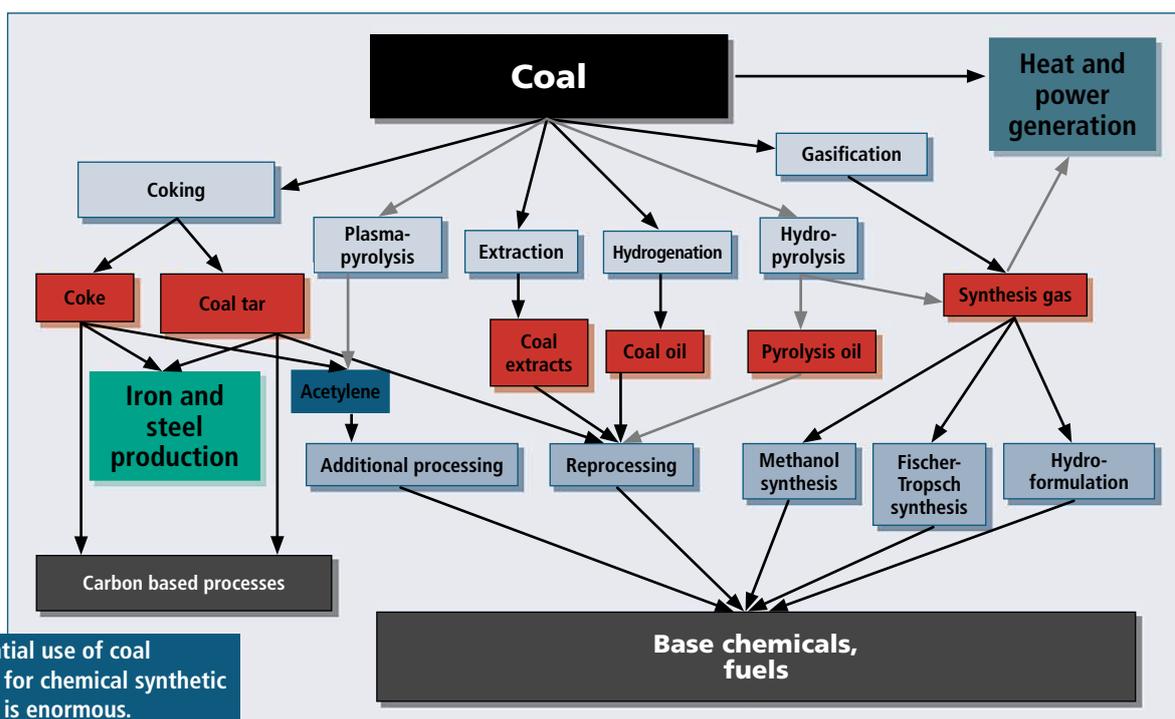
As the discussion on peak oil continues, industry increases its efforts to unlock new resources. Biomass may well become an attractive and renewable alternative in the long term, but the concept of biorefineries still requires some massive research and development efforts before it can be employed competitively on an industrial scale. Industries worldwide therefore turn to known and readily available alternatives, and coal seems to be the current champion.

The global coal reserves are estimated to amount to 826 billion tons (World Energy Council Interim Update 2009). China owns about 12% of the world's accessible coal reserves with a reach of about 50 years. More than 50% of the 2,7 billion tons of coal that were mined in 2008 were used for electricity generation, while only about 5,5% are processed to chemicals.

The potential use of coal as a basis for chemical synthetic pathways is enormous, as the figure shows. Only a small fraction of the accessible pathways is currently used on an industrial scale. One of them is the direct coal liquefaction (coal hydration). In order to obtain

„coal oil“, grinded coal is suspended in a coal-based oil and processed in the presence of a solid semi-metal based catalyst with hydrogen under high pressure and at temperatures of about 450°C. The catalysts used for the first step are one-way catalysts, as the recovery from the hydrogenation residue is too complex. An alternative route is the indirect hydrogenation using e.g. Tetralin. When the coal oil is separated from the residue via distillation, it has to be purified and processed as it contains large quantities of aromatics, S- and N- compounds. This is done via hydrotreating.

Currently, three different processes have been developed to industrial scale. One of them, the Direct Coal Liquefaction process (HTI/DCL) developed by US-based Hydrocarbon Technology is the basis for a plant that is going into operation in China this year and is expected to process 1–1,5 million tons of coal annually. Compared to other well-established processes like Fischer-Tropsch, coal liquefaction has thermodynamic advantages, but it requires high-quality coal and large



Picture: DECHEMA

amounts of hydrogen. Trial operations of the first completed commercial coal-to-liquid plant in China are currently under way. However, the recent economic developments have had an impact on coal chemical projects in China. In September 2008, the government stopped all coal-to-liquid projects but two, as the dramatic decrease in oil prices rendered them noncompetitive. Only the Shenhua Erdos Project and the Shenhua Ningmei-Sasol Project were continued.

A well-known and widely established process is coal gasification, where coal is processed with oxygen and water vapour to "synthesis gas". Worldwide, about 45 million tons of coal are processed per year. China started construction of its first large scale coal-to-gas plant in Inner Mongolia in August 2009. Until 2012, four billion cubic metres of synthetic gas are expected to be supplied annually to Beijing. The plant will also produce synthetic oil and naphtha. The technology used is provided by US-based Great-Point Energy.

Focus on modern and clean technologies

Driven both by economic considerations and by the recently announced intention to contribute to climate protection and lower pollution, development plans have been thoroughly revised. Now, efforts are being focused on modern and clean technologies. In its "Exposure Draft of Mid- & Long-Term

Development Plans of Coal Chemical Industry" published in 2006, the National Development and Reform Commission NDRC laid down its strategy to concentrate on the production of coal-based methanol, dimethylether, alkene and oil while production volumes of "traditional" products like coke, chemical fertilizers and calcium carbide would stay constant or even be reduced.

Foreign investors have not been discouraged by the postponement of the coal-to-liquid projects. German Süd-Chemie announced its take-over of BASF's syngas catalysts production facilities in Nanjing in April 2009. According to Süd-Chemie, China's share in the global market for syngas catalysts is 30% and the market is still growing. Even international companies that have been affected by the shut-down of coal-to-liquid projects like Shell continue their engagement in China. Shell and Shenhua, China's biggest coal producer recently signed a memorandum of understanding to conduct joint research and development on clean coal technology.

According to NDRC, China intends to spend about US\$ 128 billion on the development of a coal-based chemical industry. In the mid- and long-term the Chinese market offers many opportunities for companies and investors active in plant engineering, supplying gases and catalysts and other technology. ■

The availability and quality of water play a major role in investment decisions in the process industries. Improved production efficiency and demand for better product quality make it essential to optimise the water supply strategy during the process development process.

Water – a valuable resource

Process water is a valuable resource in the chemical industry and even more so in the pharmaceutical industry. For example, ultrapure water plays an important role in drug production, injection fluids, the optical industry, chip production, solar technology, medical research, chemical analysis and feedwater for steam generators. Annual turnover of ultrapure water systems in the pharmaceutical industry will expand by an average 8%. Demand in the biotechnology sector will grow at a faster rate compared to the overall market for pharmaceutical ultrapure water systems.

Water purification methods are as varied as the applications: distillation, ion exchange, micro, ultra and nano filtration, reverse osmosis and electro deionisation. Users have to select the right solution from a large range of options. Membrane technology has a very high impurity rejection rate. But membranes may be susceptible to fouling (accumulation of colloids or biological substances), scaling (precipitation of salts when the solubility product is exceeded) and degradation caused by oxidants. To alleviate these problems, researchers and developers are working on coated or "grafted" membranes which are easier to clean and are less susceptible to the problems described above. The first commercial products are now available.

Electrodeionisation on the way up

However, to reduce susceptibility to feed water fluctuations, electro-

deionisation (EDI) is clearly becoming the solution of choice. EDI is a relatively new technology. Pre-treated water flows perpendicular to a constant electric field through diluting chambers limited by anion and cation exchange membranes. Due to the effect of the electrical field, the anions are attracted to the anode and the cations are attracted to the cathode. The ions pass through the membranes into the adjacent concentrate liquid from which they are then removed. The electrical field also disassociates water in the dilute chamber into hydrogen and hydroxide ions. These ions permanently regenerate the ion exchange resin, and as a result the systems can run continually without the need to shut down for regeneration.

All water systems have to be regularly sanitised to prevent microbiological contamination. Sanitisation normal-





ly reduces the number of microorganisms by a factor of 10–1000. In contrast, the goal of sterilisation is to kill all of the microorganisms. Three sanitisation methods are currently used on pharmaceutical water purification and distribution systems: steam, hot water and chemical disinfection. All of the methods require special system component materials, proper handling, special cleaning techniques and special safety precautions. Especially systems with thermal sanitisation are highly automated and offer a high degree of microbiological safety. Thermal sanitisation has the further advantage that the process can be validated and documented.

Stainless steel versus plastic

There are also differences of opinion of the right choice of material. Stainless steel systems are undoubtedly more popular than systems made of plastic. Stainless steel has a better reputation in the pharmaceutical industry. But PVDF (polyvinylidene fluoride) plastic is widely used and should always be given careful consideration during the development phase because of its superior surface finish qualities, for example in terms of ion and TOC leach out. Surface roughness $<0.25 \mu\text{m}$ is significantly better than the typical Ra value for stainless steel ($0.8 \mu\text{m}$).

However, both materials have their advantages and disadvantages. Strength and temperature resistance are the limiting factors with PVDF, for example on hot water systems. The upper limit is 85°C . And PVDF

In water treatment, stainless steel systems are undoubtedly more popular than systems made of plastic.

is inherently more expensive. In addition, the material has a large expansion coefficient, which makes it necessary to install half-shell support systems and expansion compensation joints in large pipe works.

Growth market China

The global market for water treatment technology is growing by about 6% per year, but emerging countries like China and India show significantly larger growth rates. Experts estimate that China's water treatment market will grow at a rate of 14–15% annually through 2012.

Rouging (reddish brown precipitation of particulate matter) is an unwelcome phenomenon on stainless steel, especially in hot ultrapure water systems. The causes of rouging are well understood. The red iron oxide layer is caused by removal of chromium dioxide from the surface of the stainless steel. Rouging cannot be completely ruled out on hot flow stainless steel systems but it may be reduced through selection of high-grade stainless steel and restriction of delta ferrite formation at welds. Such an anti-rouging strategy not only minimises this form of corrosion but also cuts down on the frequency of de-rouging activities. AchemAsia 2010 from 1–4 June 2010 in Beijing, VR China, is the leading international event for equipment suppliers of the process industry. As such it will once again spark off trend-setting impulses for technology developments and new business networks in the sector of water technologies, too. ■

The annual meetings of ProcessNet and DECHEMA's biotechnologists

A bridge in *many ways*

No matter whether it is an ACHEMA or AchemAsia year or not, German chemists, biotechnologists and process engineers schedule a regular date in their diaries: The annual meetings of ProcessNet, the German platform for chemical engineering powered by DECHEMA and VDI-GVC, and of DECHEMA's biotechnology section are an opportunity to stay up to date on important topics and to cross the bridge between different disciplines addressing the same themes. This year's meetings offered an extensive shared programme on the hot topics of biomass usage, microalgae as potential sources for energy or high-value chemicals, processing of natural resources and many more.

effective storage technologies in order to replace fossil fuels and nuclear power, science is yet working on the challenge of creating efficient, payable, preferably mobile battery solutions. These are competing with "chemical storage" models that are based on the generation of hydrogen, methane, methanol and others suitable for storing large amounts of energy with as little loss as possible in the conversion cycle. The mood has sombered somewhat on the use of biomass for energy generation. In his plenary lecture, Nobelprice winner Hartmut Michel pointed out that due to the low efficiency of photosynthesis, biomass cannot compete with conventional photovoltaic cells. In the following press conference, the experts detailed out that the use of plant residue for biofuels production and electricity generation is economically and ecologically worthwhile, but this does not apply for crops that are cultured explicitly for energy generation.

Focus on energy efficiency

The efficient usage of energy is another topic that has been on the agenda for a while. Mild criticism has been voiced in the media by observers who imply that most of the energy efficiency programmes in the processing industry have been rather more talk than deed, but at this year's congress several industry representatives presented their companies' initiatives for energy efficiency, some of them with remarkable results. They demonstrated that innovative concepts are indeed being implemented in the daily operating practice. Of course, energy was a dominant issue, but by far not the only area where science and engineering have made progress during recent years. A remarkable number of lectures addressed hands-on processing topics like handling of solids or mixing. Ionic liquids have been successfully used in a number of applications lately, and their proven high versatility ensures that they will stay very interesting in months and years to come. Modelling and simulation in plant engineering were also covered in many lectures, culminating in the "50% idea" that has been discussed by ProcessNet for several months

– the idea of going from the product concept to the processing plant 50% faster than in the past. The ProcessNet and Biotechnology Annual Meetings stand for continuity in the discussion of topics relevant to the process industries. Thus, this year's dominating topics provide an outlook to the questions currently addressed by the process industries that will also be discussed at AchemAsia 2011 when the global community meets in Beijing. ■



Full house at this year's meetings

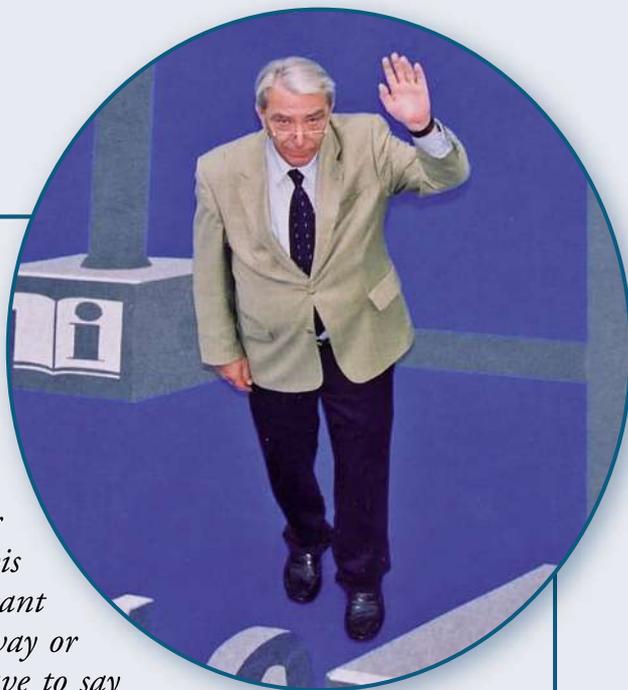
Picture: DECHEMA

"Chemistry and technology for energy, resources, health and mobility" has been the guideline for the ProcessNet meetings since 2007; the aim is to provide solutions for the current global challenges.

Sustainability stays a big issue

The question of the right concept for energy generation has been extended to energy storage and usage. While discontinuous energy sources like wind and sun call for

At this year's end Professor Gerhard Kreysa will retire, after 18 years as DECHEMA's CEO, and hand over the position at the helm to his successor, Dr. Kurt Wagemann. Over these years he has guided DECHEMA through quite turbulent times, and it is certainly his merit that our association is better positioned than it was before he took over his duties in 1992. Here is what several significant personalities who accompanied him in one way or the other, admittedly selected at random, have to say at this occasion.



Farewell to *Gerhard Kreysa*



Ren Jianxin
President of ChemChina

Since you are about to end your career as the president of DECHEMA and begin a new chapter in your life, please accept the respect and benediction from my colleagues and me. DECHEMA is one of the most respected organizations, holding the biggest exhibition in our field with incomparable influence in the world. During the past years, DECHEMA developed a very active and effective cooperation with ChemChina. And it is your outstanding leadership, professional knowledge and wisdom that made this happen. It is really hard to include all your achievements and all my respect in a few sentences. But I am sure that DECHEMA and ChemChina will continue the close cooperation in the future just like the friendship between you and me that crosses the borders of time!

According to a Japanese saying you can linger while walking, win while losing and find a beginning in every ending. With this in mind I wish Prof. Kreysa that the end of his working life at DECHEMA stands for the beginning of an exciting, new period of his life. I thank Prof. Kreysa for a close and outstanding working relationship which was always characterized by a matter-of-fact atmosphere. During the six ACHEMAs he was responsible for he was ever a reliable partner and stood for a trustful working environment. I will especially remember his perfectionism – a quality very much valued by fair organizers. I wish him that he finds the leisure to combine three things that have little in common: Travel to interesting places, playing golf and good red wine.



Uwe Behm
Managing Director, Messe Frankfurt Venue GmbH



Prof. Dr. Wolfgang Grünbein
Member of the Board, Deutsche Bunsen-Gesellschaft für Physikalische Chemie

Chemical engineering is one of the most distinguished applications of physical chemistry. So as an industrial chemist I could not avoid coming in close contact with Gerhard Kreysa who is an active member of our society since three decades. Under his stewardship, he gave admirable and continuing impulses to the community by introducing many working groups, seminars and colloquia within DECHEMA, which were often closely related to our fields of science and application. Certainly both organizations have profited from this interaction. One of the most obvious results of this friendship is his offer to our small Bunsen administration being guest in the DECHEMA building. On behalf of the Board of DGB, I am pleased to thank for all his initiatives and support. I truly hope our special, excellent relations will continue in the coming years.



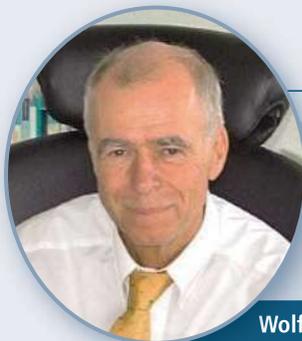
Clemens Schmees
Managing Shareholder, Edelstahlwerke Schmees GmbH

Dear Professor Kreysa, collaborating with you, with your staff at DECHEMA and with the colleagues in the ACHEMA Committee as well as in the DECHEMA Board was always characterized by full confidence and remarkable creativity. You regularly impressed all of us as a keen thinker and a brilliant speaker, addressing the goals and targets very clearly. Especially unforgettable for me and my wife was our common and really outstanding journey through China after the last AchemAsia in 2007. Alongside the old silk road, through mountains, deserts and oases we experienced plenty of unique impressions. I sincerely wish you and your wife an unfading zest for life and many inspiring future journeys and enjoyable rounds of golf.



Dr. Georg Breidenbach
Chief Representative Uhde Beijing

Being his very first postgraduate student, my personal relation with Gerhard Kreysa dates as far back as to the mid seventies. Later on our paths crossed continuously on the most diverse occasions, many of which had to do with AchemAsia and his relatedness with China. While Gerhard Kreysa was a very demanding academic teacher with a pushing working attire I came to definitely appreciate his exemplary perseverance later on in my own business career. For his upcoming retirement I sincerely wish him all the very best, especially a good balance between hours on the golf course and time spent on his various scientific interests.



Wolfgang Hansen
Director Marketing/Sales, GEA Wiegand GmbH

What Prof. Kreysa and I have in common above all is a successful and insightful period, mainly in the world of ACHEMA. His tireless commitment to promote the idea of ACHEMA left a lasting impression on me. In particular I am thinking of China where DECHEMA established the AchemAsia in Beijing, initially and effectively starting at zero, without any functioning infrastructure. All the more it has to be appreciated that today AchemAsia is the most important exhibition of the kind in the Asian region. Apart from focussing on his professional tasks Prof. Kreysa always has dealt with current problems of our times, e.g. topics such as climate change, and with his profound statements in public he frequently contributed to objectifying the discussion.



Alan R. Morris
Delegate of DECHEMA for North America

I've had the pleasure of knowing and working with Gerhard Kreysa since he took the reigns as DECHEMA's leader, first in my role as a magazine publisher, then as DECHEMA's North American representative. We all know Gerhard as a serious-minded scientist and business executive, but I want to call attention to his vision, and his willingness to take risks in order to grow DECHEMA's influence. His decision to create a worldwide team of representatives is chief among his new initiatives. I'm proud to serve as the first of his representatives. The ACHEMA Daily is another Kreysa "first". He gave his approval, and today it serves to add depth and color, and a sense of urgency to news coming out of each ACHEMA. Gerhard Kreysa has never been afraid to challenge the status-quo, and to take DECHEMA in new directions during his stewardship.



Richard Clemens, Managing Director VDMA,
Fachverband Verfahrenstechnische Maschinen und Apparate

Like no other Prof. Gerhard Kreysa has coined ACHEMA in the last decades. Under his aegis the leading role of ACHEMA as an international event for the process industries was further developed. With her special shows ACHEMA always set trends, as leading event focussing on the future. The success of AchemAsia organized in China with the same underlying concept was if nothing else decisively promoted by his wide global network.



Dr.-Ing. Reinhard Hüppe
Leiter Bereich Industrie, ZVEI e.V.

As a reputable manager who affects like a scientist I met Professor Kreysa at my first meeting of the ACHEMA advisory board. Brilliant and smooth as a jewel he shined with knowledge but also with the love to the detail. Shortly thereafter his passion for golf appeared. Other facets were seen at festive colloquiums and the ACHEMA ball. Eloquent and sleek he looks behind the lectern as well as on the dance floor. Professor Kreysa was and is a jewel, a gemstone: brilliant, tough and at the same time shining with typical engravings – as a seal of DECHEMA. I wish Professor Kreysa a long, brilliant time!

Paul Carter has recently been appointed Delegate for DECHEMA for the UK and Ireland. As Managing Director of Phoenix MarCom, a company specialising in marketing communications for the science and industry sectors, Paul Carter has a long association with ACHEMA: "Phoenix has provided support services for

ACHEMA for the past 14 years and we've always regarded it as the No. 1 exhibition and congress within the industry. My main role as DECHEMA Delegate is recruiting British and Irish companies within the chemical and allied industries to exhibit at ACHEMA worldwide events."

Carter has been encouraged by the feedback he has received when attending ACHEMA 2009: "UK exhibitors have been very positive – there is simply no other place where you can meet and engage with such a large specialist audience." Carter also sees AchemAsia 2010 in Beijing as a highly significant opportunity for exhibitors: "Most regions of China have already reported a double-digit growth in GDP and the country is the

world's second largest consumer of chemical products and the world's third largest chemical producer. As AchemAsia is held only every three years and is the most visible event for China's process industries, it's definitely an event not to be missed."

Paul Carter's work as Phoenix MarCom's Managing Director can benefit ACHEMA exhibitors in a variety of ways: "At Phoenix we offer a range of support for UK and Irish-based exhibitors. We provide services in press and public relations, media buying and placement, as well as graphic design and copywriting for electronic and print media. As the DECHEMA delegate I and my team can also provide guidance and advice on all aspects of the event."

When asked which aspect of his DECHEMA role Paul Carter is most looking forward to developing, his answer was immediate: communication! "As a communications company we enjoy engaging with our clients. Although we keep in regular touch electronically, it's always the telephone conversations and face-to-face meetings that really build relationships and make things happen. And we plan to do plenty of that!"



Contact:

Paul Carter
Phoenix MarCom Limited
Newton Hall
Newton/Cambridge
CB22 7ZE
Tel: +44 (0) 12 23 / 87 33 18
Fax: +44 (0) 12 23 / 87 41 73

New DECHEMA *Delegates*

As of January 1, 2010, DECHEMA is proud to announce that ACHEMA worldwide events are now being directly represented in Poland. Based in Warsaw, Poland's capital, **Piotr Lukaszewicz** will be the contact person for ACHEMA worldwide exhibition congresses in the country which showed one of the most significant growth rates at the recent ACHEMA.

Piotr Lukaszewicz has a solid business background and over 15 years intense involvement in marketing,

including promotion of many fairs. The long overdue engagement of a well-connected branch insider in Poland is expected to enhance the country's standing at ACHEMA and should result in increasing exhibitors' and visitors' attendance as well as better visibility in the media.

Contact:

Piotr Lukaszewicz
Targi Frankfurt Przedstawicielstwo w Polsce
Radarowa 9 lok. 32
02-137 Warszawa
Tel. +48(0) 22 / 4 02 - 11 70
Fax: +48(0) 22 / 4 02 - 11 71
e-Mail: piotr.lukaszewicz@poland.messefrankfurt.com



DECHEMA Corrosion Handbook – second revised and enlarged edition now available

The DECHEMA Corrosion Handbook provides a comprehensive collection of knowledge which is unique both in scope as well as content. Corrosion data and the chemical resistance of all technically important metallic, non-metallic inorganic and organic materials in contact with aggressive media are covered, constituting the prime source of information

on corrosion and corrosion protection worldwide for the selection of materials for equipment in which corrosive media are processed. This indispensable source of information is now available in its second, completely revised and enlarged edition.

Contact:

Dr. Roman Bender, DECHEMA e.V.
bender@dechema.de
<http://www.dechema.de>

Faced with the task of optimizing a given environment-material system, users of this Corrosion Handbook will find answers to the following:

- Is there information available on the behavior of the material under consideration in a particular medium?
- Which materials are out of question for the proposed purpose?
- Which materials can be used without hesitation in the medium concerned?
- What are the conditions under which a less resistant, less costly material will give satisfactory service?
- Which material offers best performance for value under the given circumstances?
- What protective measures exist: inhibitors, coatings, cathodic protection, etc.?

The 13 volumes of the Corrosion Handbook contain over 10,000 references to primary sources.

International Conferences organized by DECHEMA

November 30–December 1, 2009: 6th Status Seminar Chemical Biology, Frankfurt am Main/Germany

January 26–27, 2010: Chemical Nanotechnology Talks X, Frankfurt am Main/Germany

February 4–5, 2010: 12th Status Seminar Chip Technologies – Sequencing and Functional Genomics, Frankfurt am Main/Germany

March 8–11, 2010: 7th World Meeting on Pharmaceuticals, Biopharmaceuticals and Pharmaceutical Technology, Valetta/Malta

March 14–19, 2010: EUChem 2010 Conference on Molten Salts and Ionic Liquids, Bamberg/Germany

March 22–23, 2010: International Workshop "Molecular Modeling and Simulation for Industrial Applications: Physico-Chemical Properties and Processes", Würzburg/Germany

April 21–23, 2010: 13th Annual Conference of the European Biosafety Association – EBSA, Ljubljana/Slovenia

May 3–5, 2010: Trends in Metabolomics – Snapshot of Cellular Life, Frankfurt am Main/Germany

July 4–8, 2010: 1st International Conference on Materials for Energy, Karlsruhe/Germany

Further Information:

DECHEMA e.V., Congress Office
Theodor-Heuss-Allee 25
60486 Frankfurt am Main/Germany
Tel. +49 (0)69 7564-129/-333/-249
Fax +49 (0)69 7564-176
E-mail tagungen@dechema.de
Internet www.dechema.de

Imprint

Editorial Staff

Editor-in-Chief: Gerd Kielburger ☎ +49 (0)931/418-2536, gerd.kielburger@vogel.de
Editor: Dr. Jörg Kempf ☎ +49 (0)931/418-2173, joerg.kempf@vogel.de
Editorial assistant: Gabriele Ilg ☎ +49 (0)931/418-2107, gabriele.ilg@vogel.de
Editorial Office: Vogel Business Media GmbH & Co. KG, Max-Planck-Str. 7/9, 97082 Würzburg, Germany, Telefax +49 (0)931/418-2750, redaktion@process.de, www.process.de, www.process-worldwide.com
Layout: Dieter Kansog
Production: Karin Weißenberger, ☎ +49 (0)931/418-2257

Publisher

Publisher's address: Vogel Business Media GmbH & Co. KG, Max-Planck-Str. 7/9, 97082 Würzburg, Germany, ☎ +49 (0)931/418-0, Fax +49 (0)931/418-2750, A Company of Vogel Business Media
General Manager: Stefan Rühling
Advertising Manager: Reiner Öttinger ☎ +49 (0)931/418-2613, (responsible for the advertising section) reiner.oettinger@vogel.de

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