

# ACHEMA

# WORLDWIDE

News



Network –  
Research –  
Events

A special edition from

**PRO·CESS**

 **DECHEMA**

## Energy storage – a hot topic for chemical engineering

**W**hy should we chemists and engineers concern ourselves with thermal and electrical energy storage? ...

...Because the energy supply of the future, based on a soaring share of renewable sources, demands entirely new solutions:

- How can we optimize the efficiency of water electrolysis for the generation of hydrogen as a chemical storage medium, particularly under variable loads?

- How can we develop stationary batteries with dimensions exceeding those currently used for mobile applications by several orders of magnitude?

- Which materials are best suited for a thermal storage device, an important component of adiabatic gas pressure storage systems?

This is just a modest selection from a multitude of issues calling for solutions in the short to medium term. The context is the rising share of wind power and photovoltaics with their concomitant increasing power fluctuations. For this reason the energy supply of the future requires considerably higher storage capacities to accommodate both peak loads and the total energy stored.

Physical storage technologies, such as compressed air in large underground caverns or conventional storage power stations, are undoubtedly the cheapest options, however their capacity is limited. Today large-format batteries seem to be a more viable option than they were just a few years ago. One example can be seen in Japan where large sodium-sulphur batteries have been installed as storage devices for a wind power plant. Even lithium-ion batteries would be conceivable if they could be effectively prevented from short-circuiting. The requisite containment and, to a similar extent, the housing of the control units require a considerable amount of space even when they are installed locally, i.e. directly next to a wind power plant or a photovoltaic array.

A third important part will address chemical energy storage. At first in situ hydrogen production by electrolysis would appear to be the obvious solution. But is hydrogen really a suitable primary storage medium? The costs of its transportation, the energy losses in the production chain from the electrolytic cell via compression and transport through to its reversion into electricity currently exceed 70%. Over and above this, there is the issue of the necessary infrastructure — all of which culminates in the question as to whether we genuinely consider it realistic to install millions of hydrogen-powered fuel cells, for example for domestic use. Production of methanol or ethanol may well be an attractive option for territorially vast countries with a less well developed energy infrastructure, such as China, India or Brazil. In countries like Germany methane may well become the storage system of choice, particularly as it has an excellent (natural) gas network. Biomass could be directly integrated into the system as bio natural gas, the more so once efficient processes for converting lignocellulosic materials into biogas have been discovered.

Energy production in wind energy parks and with photovoltaic power plants entails, in the first place, an unexpectedly strong need for R&D in chemical engineering. Innovations in catalysis and especially in the entire field of electrochemistry are no less needed than advances in the management of heat flows.

Hence overall, one might conclude that a corresponding ACHEMA "Special Show" should trigger plenty of discussions on fresh ideas and new concepts. Headed "Innovative Energy Carriers and Storage", the Special Show 2012 is dedicated to precisely this topic. I would be happy if these brief thoughts have piqued your curiosity, and I trust you won't miss out on this chance to witness first hand some exciting progress in this field at ACHEMA 2012.



**Dr. Kurt Wagemann,**  
**DECHEMA**  
**Executive Director**

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# Winds of change

*ACHEMA 2012: What are the novelties?*

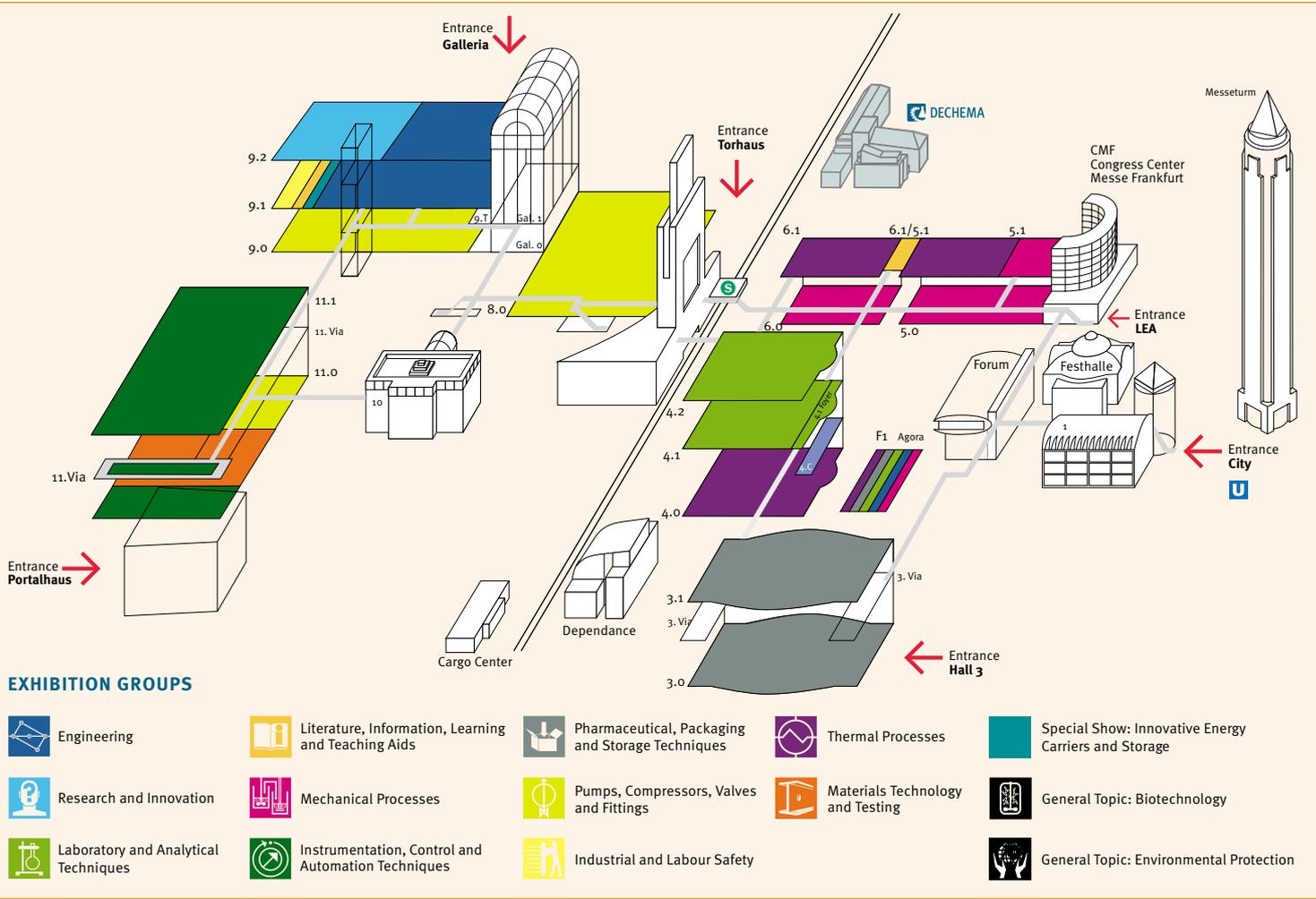
— DR. THOMAS SCHEURING —

Each upcoming ACHEMA is a major target point for most of our exhibitors. As the organizers it is also an opportunity to rethink our exhibition concept and to rearrange or fine tune organizational matters. Usually this involves weighing new ideas up against established, well proven procedures. ACHEMA 2012 is no exception. Once again I think we have found a good compromise between new innovations and the tried and tested. Some fresh thinking is helping to create a package that will work well for all our exhibitors. So what are the novelties in 2012?

The author is Head of Exhibition-Congresses, DECHEMA e.V.

The first point actually is not a novelty – we were able to keep our tariff constant, so rental fees are the same as three years ago. This is good news for our exhibitors, and is a gesture of gratitude to our exhibitors for their loyalty with ACHEMA throughout the difficult year 2009.

Recently the Frankfurt fairgrounds have been enlarged substantially by a new two-storey exhibition hall 11. The Western part of the fairgrounds now benefits from an adjacent new entrance building and the completed visitor walkway "Via Mobile". This new hall 11 enables us to rearrange ACHEMA's hall allocation to improve what is on offer from each of our exhibition groups. For ACHEMA 2012 hall 11 will now accommodate the automation and control exhibitors who will be happy to leave their quite congested surroundings and fully appreciate the long-awaited expansion space. The size of this new hall allows us to also allocate the overflow of the pumps and compressors group there which was spread among halls 9.1 and 9.2, plus the materials technology group from hall 3. A side effect of this latter move is additional, much-needed space for the pharma and packaging group in hall 3.



There is also a change for the laboratory group which used to occupy the upper three levels of hall 6, together with hall 5.1. As parts of hall 6 are no longer available for exhibition purposes, a change was inevitable there, and the resulting coherent presentation of laboratory and analytical equipment in halls 4.1 and 4.2 marks a definite advance for this group. The mechanical process group is also seeing progress being made and is now located in hall levels 5.0 and 6.0 with the addition of 5.1 which became vacant following the laboratory group move. Although we know the whole procedure seems like a giant chess game we believe we have hit on a winning strategy for all involved. All these amendments had been pondered very carefully before being discussed intensely by our ACHEMA committee where they were finally approved.

### **What else is new?**

- Redesigned, much smaller company signboards allow for better utilization of the exhibitor's booth space while giving the visitor all the orientation information they require.
- Replacing the previous, frequently criticized single invoicing of catalogue and website entries by a new package rate makes life easier for everybody. The package comprises more features than the previous basic entry yet amounts to just the expense previously spent by the average exhibitor for their media entries.
- Our special show "Innovative energy carriers and storage" will be addressing a key issue which is the focal point of many industry branches – whereby any technical progress in this field is inconceivable without the contribution of the chemical engineering discipline.
- A complete redesign of our website "ACHEMA

online" with enhanced usability will ease access and lead to improved transparency of the information content at ACHEMA.

- The tariff of the visitor flat rate – which gives every exhibitor access to an unlimited number of guest tickets and is correlated with the booth-size – has been fine graded, resulting in a more even gradient for varying booth sizes. So although we are making numerous changes at ACHEMA, there is one thing for sure that has not changed: ACHEMA is an event simply not to be missed in 2012! ■

# Reliable concepts *for the automation of* **fixed-bed filters**

*Handwheel control or an automated shut-off valve? The trend world-wide is clearly towards automation. Automation saves energy and water and increases operational reliability. This is illustrated, for example, by the pneumatic automation of fixed-bed filters in a waterworks.*

— DR. WOLFGANG RIEGER —

**F**ixed-bed filters of open or enclosed design are an important element in the water-treatment processes carried out in waterworks or sewage treatment plants. They soften, deacidify or harden the water as desired and remove turbid and non-biodegradable materials.

## Structure, purpose and function of fixed-bed filters

The function of a fixed-bed filter is determined by the type, particle size and structure of the filter bed or bulk material used in the filter. Depending on the purpose of the filter, the bulk material may, for example, be sand, gravel, hydroanthracite or activated carbon in one or more layers.

Generally five to eight shut-off valves will be required in order to control a fixed-bed filter. Of these, up to three shut-off valves will operate under closed-loop control, the others in simple open/close mode.

The author is with Festo AG & Co. KG.

Untreated water is fed through the bulk material. The large surface area of the particles onto which the turbid material settles creates the filter effect. The longer the filter is in operation, the more dirt will accumulate, causing the flow rate through the filter to decrease. If a filter is heavily contaminated, the only remedy is to clean it by filter washing.

## Pneumatics as an alternative

For the shut-off valves pneumatic actuator and automation solutions are an interesting alternative in terms of economy and technology. This applies particularly with regard to total costs of ownership.

Pneumatics offers greater functionality for the control of shut-off valves and can be used to achieve automatic activation of safety functions as appropriate to the operating situation. This is especially useful with regard to the behaviour of shut-off valves in the case of an electrical power failure where no emergency generator is available. The particular functions involved are the normal position of shut-off valves when a system is out of operation or starting up and the safety position of shut-off valves during an energy supply failure: automatic closure, automatic opening or automatic maintenance of current position (Fig. 1).

## Flexible automation

The number of fixed-bed filters can vary between two in the case of small local waterworks and up to 48 or more in the case of waterworks for large cities. Any automation concept must therefore be decentral

and flexible and combine pneumatic and electrical components. Pneumatic valve terminals are particularly suitable for this purpose. These provide a link between the pneumatically-actuated shut-off valves and the end-position sensors, measuring equipment and system or process control level.

One future-oriented system-solutions development is a control cabinet which allows plant operators to set at a central point all the parameters required to control the shut-off valves of a fixed-bed filter.

Fig. 2 shows the previous conventional solution. For the shut-off valves with an open/close function, pneumatic actuators and individual valves with a NAMUR interface are

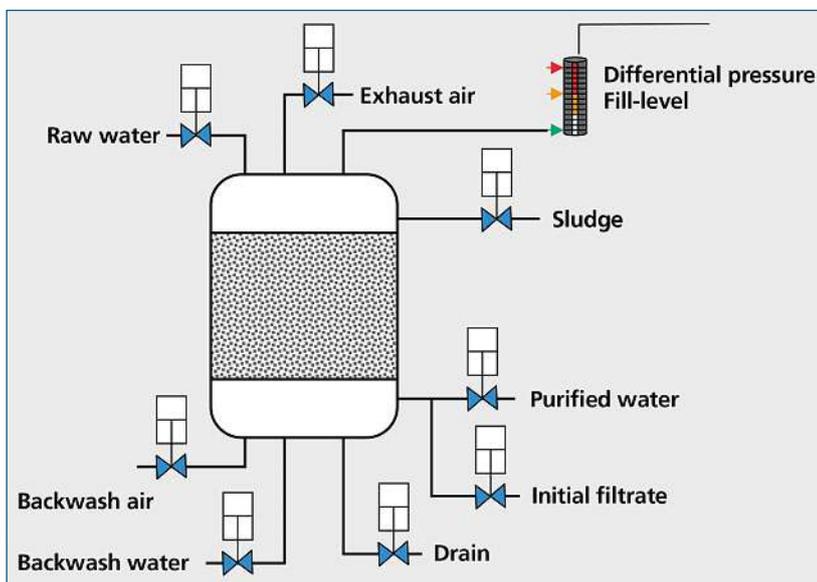


Fig. 1: Schematic diagram of a fixed-bed filter in a waterworks

Pictures: Festo

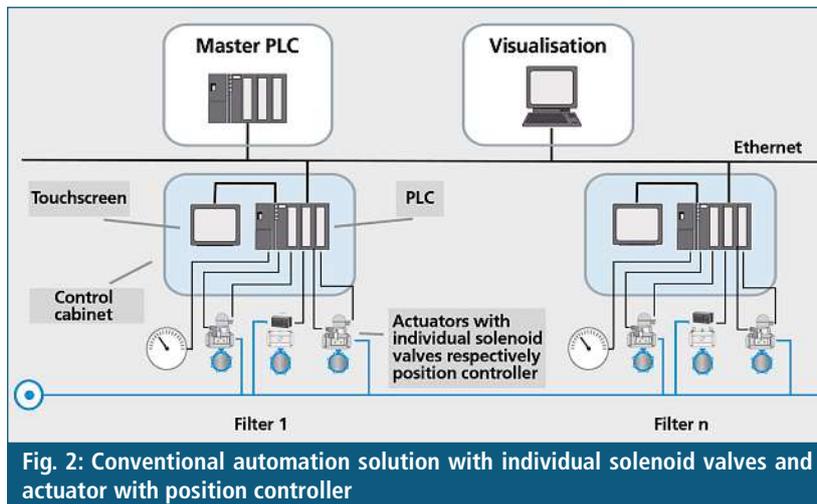


Fig. 2: Conventional automation solution with individual solenoid valves and actuator with position controller

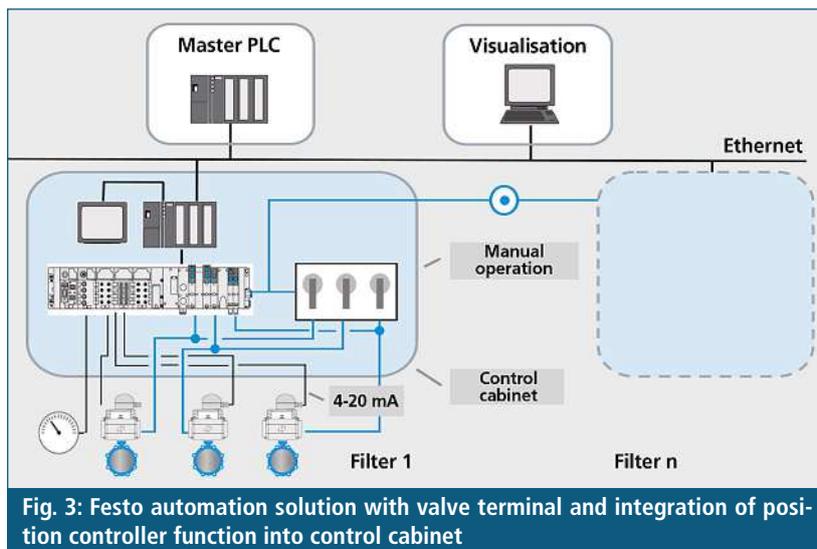


Fig. 3: Festo automation solution with valve terminal and integration of position controller function into control cabinet

mounted directly on the actuator. The control valve for the filter outlet is equipped with a pneumatic actuator and a position controller. A control cabinet is assigned to each fixed-bed filter. The major components of the control cabinet are a touch screen to control the installation and a PLC. This is linked to the master control level, consisting of a higher-level PLC and a visualization system, via an Ethernet connection. The PLC in the control cabinet controls the shut-off valves, while the higher-level PLC controls the reverse flushing of the individual fixed-bed filters.

Fig. 3 shows the new solution. The major differences are: Valve terminal instead of individual valves, integration of a pneumatic manual control panel and elimination of position controller by distributing its function among three components: Feedback signal for the shut-off valve position by means of a sensor box with an analogue output 4...20 mA, activation of actuator by a 5/3-way sole-

noid valve on the valve terminal and relocation of the controller software to the PLC.

In comparison with a conventional solution with a position controller, this solution offers several advantages:

- It does not require such high-quality compressed air as the position controller previously used.
  - The higher flow rates of the solenoid valves allow fast motions and provide a safety function, even with large actuators.
  - The shut-off valve can be adjusted via the manual control panel alone even without electrical power.
  - The plant operator no longer needs to go to the shut-off valve, since he can make control parameter changes directly on the control cabinet.
  - A high level of reliability, not only during commissioning but above all during normal operation.
- Overall, this solution is more economical than the conventional solution. ■

*Fruitful discussions, high quality visitors, a positive atmosphere, and exhibitors who shared the organizers' satisfaction with the new venue – that was the summary of the 8<sup>th</sup> AchemAsia early June in Beijing.*

## Positive summary

*and intensive networking*

## at AchemAsia 2010



The Chairman of CIESC, Professor Cao Xianghong, gave a speech at the opening ceremony.

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With 413 exhibitors from 24 countries and 12,453 attendees, AchemAsia is not only the most international event for China's chemical process industry, but also the one with the broadest acceptance in its target audience. In his welcoming address, Prof. Cao Xianghong, chairman of DECHEMA's local partner association Chemical Industry and Engineering Society of China, underlined the importance of international exchange for the Chinese process industry. This holds true even



All plenary lectures were met with especially high interest.



Dr. Hans Jürgen Wernicke, Chairman of DECHEMA, gives the Achema Plaque in Titanium to Mr. Ren Jian-Xin, the President of ChemChina.



Impressions from the exhibition halls

more for this year when the impact of the financial crisis was still perceptible in China.

In the mid- and long-term it would be essential to prepare for the shift of the resource base that will become necessary in the face of dwindling fossil resources. Cao also gave an account of the challenges caused by limited water resources especially for coal conversion in regions with rich deposits.

DECHEMA's chairman, Dr. Hans Jürgen Wernicke, also referred in his statement to the necessity of a sustainable supply of energy and raw materials. He also underlined the particular contribution of the process industries in this context and expressed his contentedness that the Chinese partners were giving priority to the same questions that were also moving Western industrial nations.

With 190 exhibitors, China accounted for the largest group, followed by Germany (118), France (23) and the US (11). The exhibitors also commended the increasing regional spreading of the visitors attending the exhibition and conference program in the new China National Convention Center. Among the 89 lectures, all plenary lectures and the sessions on water treatment, clean energy and bio-refineries as well as the exhibitors' presentations were met with especially high interest.

Sustainability in energy generation and production were in general leading topics. These issues are also in the focus of China's research and development efforts. A VIP meeting on water treatment offered an opportunity for animated discussion and experience exchange among about 25 professionals.

"We took a chance with a lot of innovations in this year's event. This courage has paid off. Not only the shorter, more compact timeframe, but also the new location close to the Olym-

pic Park with its modern exhibition facilities and the enhanced integration of exhibition and congress have contributed to the success of this AchemAsia. We will certainly continue on this route", Dr. Kurt Wagemann, DECHEMA's CEO, summed up.

Part of the accompanying program of AchemAsia were a guest event on Pharmaceutical Engineering, organized by PROCESS China, and a session on laboratory automation by the Association for Laboratory Automation (ALA) from the United States. The next AchemAsia will be held in the spring of 2013 in Beijing. ■

## "A solid reputation for itself"

*Positive Feedback from  
AchemAsia 2010 French and  
Belgian Exhibitors*



**Sandrine Parisot,**  
Executive Assistant, Mersen (ex Carbone Lorraine)

"Exhibiting since 1998, our participation at AchemAsia 2010 was very successful. Our goal was to communicate on two things: our new company name Mersen and our new production capacity of 150,000 m<sup>2</sup> in Shanghai. On the very first day, we met company representatives that plan to order 21 of our stainless steel tanks every year! This proves, if need be, that AchemAsia truly attracts professionals with projects looking for solutions. The new venue on the Olympic grounds is more attractive and modern as well."

**Pavlos Papadopoulos,**  
Project Sales Manager, Bekaert Advance Filtration

"We were very impressed by the number and quality of visitors on the second day of AchemAsia. Our efforts to prepare the event paid off and we are globally satisfied with our participation at AchemAsia 2010. The CNCC, a new venue in the Olympic area, is much more attractive than the prior location, even though there is a need for more restaurants and snack bars. China is THE market attracting the world's attention and where the major players in our industry want to be. And the Chinese are eager to learn from us, it's a win-win situation."



**Charly Vanhaecke,**  
Business Development Manager, Clestra Hauserman China

"AchemAsia 2010 was an excellent opportunity to approach the Chinese market, to better understand the needs of local clients and to fine tune our sales strategy. We surpassed our exhibition goal in terms of visitors, and are already in contact with Chinese and International partners on potential projects."

**Joseph Sassonia,**  
Vice-President and Sales Manager, Danfoss Socla

"We are completely satisfied with our participation at AchemAsia 2010. A very well-organized event, AchemAsia has built a solid reputation for itself in Asia. We welcomed numerous visitors on our stand: distributors, end-users, outfitters, international purchasers. Our business' success is founded on human interaction and AchemAsia was an excellent opportunity to do just that."





**Julien Grandidier,**  
Asia-Pacific Area Manager, Geogin

"We are globally satisfied with AchemAsia 2010. The new exhibition venue is conveniently located, modern and a good size. Despite the risk of being copied, there are numerous interesting projects to be found in China. After years of targeting the lowest cost, China is awakening to the importance of quality, which is pushing the end-client to ask for apparatus and equipment made in Europe."

**Jean Vanssay,**  
Marketing Manager, Meca Inox France

"Our participation at AchemAsia 2010 was extremely positive. It allowed us to present our company to the Chinese market for what it is, not merely a French exporting company but a French company based in China, from an industrial and a sales point of view. The four-day duration of the show is a good formula allowing the sales team to not exceed a week of absence."



**Gilles Hameury,**  
Marketing-Sales Manager, Prosim

"In general, we are quite satisfied with AchemAsia 2010. We were testing the potential of the Chinese market. Most of the visitors we met during the event are already equipped with process simulation software, but are not satisfied with what they have. This opens up a lot of opportunities for our products and services."



**Nicolas Malotau,**  
General Manager, Tami Separation Technologies China

AchemAsia 2010 met our expectations: a public of professionals interested and motivated by the discovery of the latest technological innovations. The convenient location of the exhibition allows for better visitor numbers and the possibility to visit the charming Chinese capital once the working day is done.



**Clémence Hauteville,**  
Project Manager Chemistry, Mines and Quarries UbiFrance

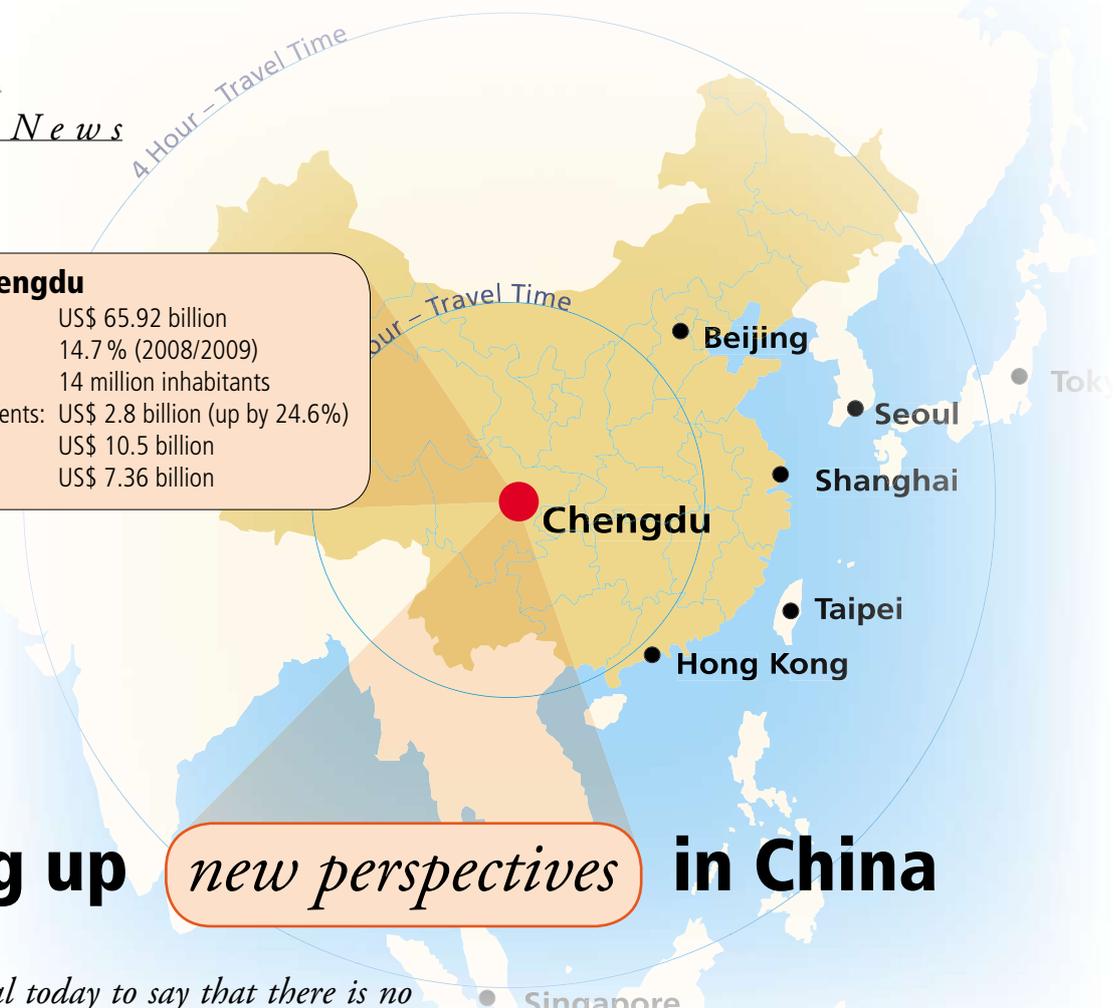
UbiFrance, the French Agency for International Business Development, financially supported French companies participating at AchemAsia 2010, by offering the possibility to rent "turnkey" stands within the French pavilion. The operation was a success: the exhibitors expressed their satisfaction with AchemAsia, especially the highly qualified visitors, and were happy to benefit from the enhanced visibility thanks to the group participation. UbiFrance has already reserved the next Achema appointment: Achema 2012 which will take place in Frankfurt am Main, 18–22 June 2012.



4 Hour – Travel Time

**Fast facts on Chengdu**

Regional GDP:	US\$ 65.92 billion
Regional growth rate:	14.7 % (2008/2009)
Population:	14 million inhabitants
Utilized foreign investments:	US\$ 2.8 billion (up by 24.6%)
Local exports:	US\$ 10.5 billion
Local imports:	US\$ 7.36 billion



**Opening up** *new perspectives* **in China**

*It is trivial today to say that there is no alternative for chemical companies and their suppliers to do business in the PR China. Everyone knows it – and everyone does it. But there is a China besides the trend-setting mega-cities Shanghai, Beijing, or Guangzhou. A China with a little less glamour but excellent infrastructure, skilled and well-trained workforce and a great business environment...*

**I**n this issue of ACHEMA worldwide news we are introducing to you the city of Chengdu, capital of Sichuan Province and host of the recent successful "High Level Advanced Materials Forum". For the chemical process industries Chengdu plays a key role insofar as it is the state council confirmed center of logistics, trade, finance, science and technology in Western China, and the main regional transportation and communication hub. On a national scale, it is an important base for high-tech industries and industrial manufacturing. Over the past several years Chengdu has been explicitly attracting technology-oriented industry sectors, and the city is steering a political course committed to sustainable development with a clear technology-driven focus. The

• Singapore

development of Chengdu as the major industrial hub in Western China is part of the central government's strategy to strengthen central and Western China, and to build a counterweight to the booming coastal and Eastern areas. Furthermore, Chengdu, although a historical city of 2,300 years, is designated as a national role model city of environmental awareness where inhabitants are living under healthier conditions than in some other severely polluted urban areas.

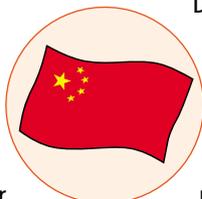
While the industrial sectors playing a significant role in Chengdu range from chemicals over aerospace and automobile to information technology, Chengdu is one of the few cities worldwide with a designated advanced materials industry zone, located in a distinct quarter within the metropolitan area. This unique feature has been an additional point for the decision to hold the Advanced Materials High Level Forum in Chengdu earlier this year. This symposium is an innovative event format bringing together decision makers from the chemical process industries in China with their international counterparts. After the first two events had been held in varying locations with increasing success, the main organizer, state-owned holding ChemChina with their charismatic chairman Ren Jianxin, and DECHEMA, their international co-organizer, are considering to establish the Advanced Materials Forum in Chengdu on a longer term since the venue offers attendees an excellent event location combined with a suitable industrial environment. ■

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## Ionic liquids *in the process industries*

*Research on ionic liquids is progressing at a faster pace in China than anywhere else in the world.*



Ionic Liquids (ILs) are organic salts with a melting point below 100 °C. The vapor pressure is usually barely detectable. ILs are non-flammable and are normally in the low to high viscosity range. Because ionic liquids are miscible with ordinary solvents, they can be used in many chemical reactions. Due to their electrochemical, chemical and thermal properties, they appear to offer significant potential for development of "greener" and more eco-friendly methods and applications in the process industry.

At the beginning of this decade, only a few publications were released by Chinese Academy of Science (CAS) research institutions, but the contribution from China has recently exceeded 30% of publications worldwide. The main research centers are currently the Institute for Chemistry (IC) and the Institute for Process Engineering (IPE) in Beijing along with the Lanzhou Institute of Chemical Physics and the Dalian Institute of Chemical Physics. The researchers are looking at synthesis and characterization of new functionalized materials and at applications for these materials. Clean energy ap-

plications such as CO<sub>2</sub> capture, desulfurization and catalysis are attracting particular attention.

Despite the fact that the Chinese chemical industry is just beginning to get involved in this still-nascent technology, expectations are high because ILs may help industry migrate to more eco-friendly processes. Under the circumstances, it is hardly surprising that pilot scale implementation and evaluation can take place very quickly if lab-scale results look promising. In particular, the suitability of ILs as catalysts for petrochemical processes and for synthesis of cinnamic acid and trioxan has been successfully demonstrated in recent years. The scale in this case (several tons of ILs) was remarkable, making it one of the largest processes worldwide based on this technology. The leading research institutes in China are already going one step further by testing the materials in high-tech applications such as lithium ion batteries and super capacitors.

Existing research organizations which belong to European and American companies, particularly in the Shanghai region, are trying to keep up with the rapid pace of development, and they hope to benefit from the Chinese approach of "moving very quickly to a large scale". Another advantage of that location is the availability of low-cost raw materials which are used to make a wide range of ILs and are produced locally for the world market.

Besides a number of university spin-offs which are actively involved in the synthesis and production of ionic liquids, a few companies have now begun to market materials which were developed specifically for gas desulfurization applications. ■

This article is based on an AchemAsia trend report by Prof. Dr. Urs Welz-Biermann, Chinese Academy of Sciences, Dalian/PR China.



Ionic Liquids offer new solutions for the chemical industry.



Using Ionic Liquids, e.g. removing acids from reaction mixtures is now fast and simple.

Pictures: BASF

*The World of Chemical Engineering and Biotechnology will meet in Berlin on 25–29 September 2011 on the occasion of the 8<sup>th</sup> European Congress of Chemical Engineering (ECCE8) in conjunction with the first ever European Congress of Applied Biotechnology, the annual ProcessNet Conference, and the DECHEMA annual biotechnology conference. More than 3,000 participants are expected. For Dr. Hermann J. Feise, Chairman of the Scientific Committee of ECCE8, this event offers the chance to discuss all aspects of the dynamic changes which influence our lives, our jobs and our profession.*



## "A truly exceptional event"

Dr. Feise, what synergy effects are you expecting from the four events?

DR. FEISE

*The ECCE8 in Berlin is promising to become a truly exceptional event. In Germany we have a successful tradition of running our national conferences on Chemical Engineering and on Biotechnology together – both of which are part of the Berlin event. The development which has culminated in really joined sessions, e.g. on downstream processing, has proven that common interests exist and that the scientific discussion benefits both: engineers and biotechnologists. In Berlin we are bringing this proven collaboration into the European dimension, allowing the Chemical Engineering and Biotechnology communities to expand their networks not only between technological areas but also across country boundaries.*

Renewable energy, avoidance of CO<sub>2</sub> emissions and changes in the raw material mix are the hot topics at the moment. Will this be reflected at ECCE8?

DR. FEISE

*Energy, CO<sub>2</sub> and raw materials are the mega topics of today's chemical engineering and biotechnological research. We are reflecting this in ECCE8 within our regular program as well as in special symposia. The EFCE Section "Process Engineering for Sustainable Energy" will organize a symposium dedicated to "solar energy for fuel" which looks into the capture and transformation of solar radiation into transport fuels. The ECAB has specifically issued a call for papers on "renewables, biofuels and bioenergy" as well as on "bio-based products: materials" where people will be looking into the future energy supply and coming raw material sources for our manufacturing industries. However, we also look into secondary raw materials. Today more and more of our mined raw materials are being consumed at rates far beyond prior known limits. We now talk of limits to the supply of lithium, a metal we were not even aware of using it 25 years ago. Even more worrisome is the possible depletion of our phosphor mines. Lack of phosphor would drastically change our way of agriculture. Even more so since we are now thinking about using more of the plant material (e.g. straw for cellulose-break up and subsequent production of bioethanol fuels), which would remove more matter from the agricultural cycle and thus requiring more fertilizer, i.e. more phosphor. From the chemical engineering side we will be covering work on post-processing the flue gas stream of power plants. One has to remember that power plants have a service life of around fifty years. So in order to achieve the European CO<sub>2</sub>-reduction targets we have to find ways to reduce their environmental impact long before we can shut them down.*

Intelligent solutions will be needed to fully exploit the potential of renewable energy. How much priority will be given to this issue at ECCE?

DR. FEISE

*Future energy supply will be one of the main focus areas of ECCE8. The topic is much wider than the renewable energy sources you mentioned. What we really need to look at is sustainable energy sources. The most prominent contribution to this will be our special symposium on "solar energy for fuel". Other fields covered will include "energy: storage, fuel cells" and "renewables, biofuels and bioenergy". With these topics plus the energy related topics from ECAB, the Berlin event will be the source of information about intelligent use of sustainable energy sources for years to come.*

The agenda at ECCE will not be restricted to these hotly debated issues. The "good old" unit operations will also be addressed. What effect will process intensification have on these operations in the future?

DR. FEISE

*Research funding and public discussion of the last decade have been focusing on mega-trends, on applications and on technologies for the solution of societal problems like energy, water or climate change. This now gives us a lot of experts on this section of technology which floats like the tip of an iceberg above the surface of public awareness. What we find is a peculiar lack of PhD-level skilled people on the bulk of technology that creates the buoyancy of the technological iceberg, the competitiveness of the European chemical and biotechnological industries. This buoyancy is related to the "good old" unit operations and transport phenomena. We will therefore make a conscious effort to generate a good balance between new topics and the decisive fundamentals. I am particularly happy that we will have a specific topic on process intensification as well as on various aspects of reaction technology. Process intensification is our greatest chance of advancing our skills in those fundamentals of energy and mass transfer. With its strife for step changes, process intensification will also prevent us from that convenient trap of doing it simply the old way, just a fraction more efficient.*

Project execution times have a major impact on profitability in the chemical industry. What innovative strategies are available which can help reduce execution times?

DR. FEISE

*Project execution times truly have a major impact on profitability. This was always the case but has become even more so in today's world of rapidly changing demands. It used to be that delayed completion would lessen your profitability, today you may have lost the opportunity to sell your product at all – just think about what happens on the mobile phone market. This is where the "50 percent idea" developed from over the last two years, which looks into ways of shortening planning times and with it time-to-market. We are now developing and expanding ideas like the "plant-copy concept" or the "plant-in-the-box" strategy.*

*Both sacrifice optimization of conversion and energy efficiency for advantages in execution time and investment cost. It will be exciting to see, where these concepts will have been applied and which benefits will have been reaped from them.*

Now that Europe has initial experience with the Bologna Treaty, there appears to be some room for improvement. What messages will the Congress be sending to the universities?

DR. FEISE

*The Bologna Treaty has tried to improve compatibility of education programs and mobility of students throughout Europe. The transition from the old education programs to the new two (three) cycle concept has been painful in many places. One just has to remember the student unrest in Germany a little more than a year ago. What we see now is that the changes made have resulted in programs meeting the format of the Bologna concept but scarifying the Bologna purpose of improving our academic education. Especially many first cycle (Bachelor) programs concentrate on completing courses instead of focusing on acquiring skills like independent learning, which should characterize today's engineering profession. In doctorate programs we can see this as well. Newly funded graduate school PhD-courses try to generate a doctorate in less than three years by subjecting students to more classroom time and less independent scientific work. I believe that Berlin will tell universities that the their task is not to press a student through as many classes and subjects as possible but to educate a person capable and willing to take over responsibility for solving the problems of our society – locally, Europe wide and globally – today and in the days to come. There are challenges enough and it takes a person, not a database, to overcome them.*

Dr. Feise, thank you for taking the time to speak with us.

**Congress venue:**

ICC – Internationales Congress Centrum Berlin ([www.icc-berlin.de](http://www.icc-berlin.de))

**Congress fee:**

early registration 490 € (till July 15, 2011), regular registration 590 €, students (copy of student identity card required) 150 €

The registration fee includes admission to the lecture and poster programme, the company exhibition and the list of participants, as well as welcome reception, coffee breaks and the poster session.

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# Chemtech: Catalyzing growth *since 1975*

**W**hat started as a simple idea of a trade fair over 35 years ago continues to influence the chemical industry today. Chemtech Foundation brings together the entire cross-section of India's chemical and process industry from suppliers to sellers to manufacturers across chemicals, pharmaceuticals, fertilizers and other process industries. The exhibition and conferences will offer great networking opportunities and exhibit state-of-the-art technologies from national and international players.

## Advantage India

Post-liberalization, Indian economy has witnessed immense growth and emerged as an important destination for the global manufacturing industry. Chemicals, pharmaceuticals, petrochemicals, fertilizers, polymers, water and waste water treatment, paints and coatings industries etc, have shown robust growth during the past decade, and the same positive growth trend is expected to continue over the next few years that will drive the demand of technologies in the Indian market.

Indian chemical industry, the third largest in Asia and twelfth largest in the world, has registered a growth of around 8–10 percent. It is expected to cross USD 150-billion mark by the year 2013. With the new Petroleum, Chemicals, Petrochemicals Investment Regions (PCPIR) policy in place, the petrochemicals sector is expected to maintain the high growth momentum. These two sectors have undergone major transformations and the country will witness significant increase in numbers of new facilities and players entering the Indian market. With the recent gas discoveries, the country will secure feedstock supplies for the fertilizer industry, and there are plans to invest USD 10 billion over the next few years to reduce the imports.

Indian pharmaceutical industry is second largest in the world and is growing rapidly. The country is developing as the global hub for re-search activities in the fields of

*Chemtech World Expo, one of the largest events worldwide for the chemical process industry, is organized by the Chemtech Foundation, with the 25<sup>th</sup> edition taking place from 23<sup>rd</sup> to 26<sup>th</sup> February, 2011, at the Bombay Exhibition Center in Mumbai.*

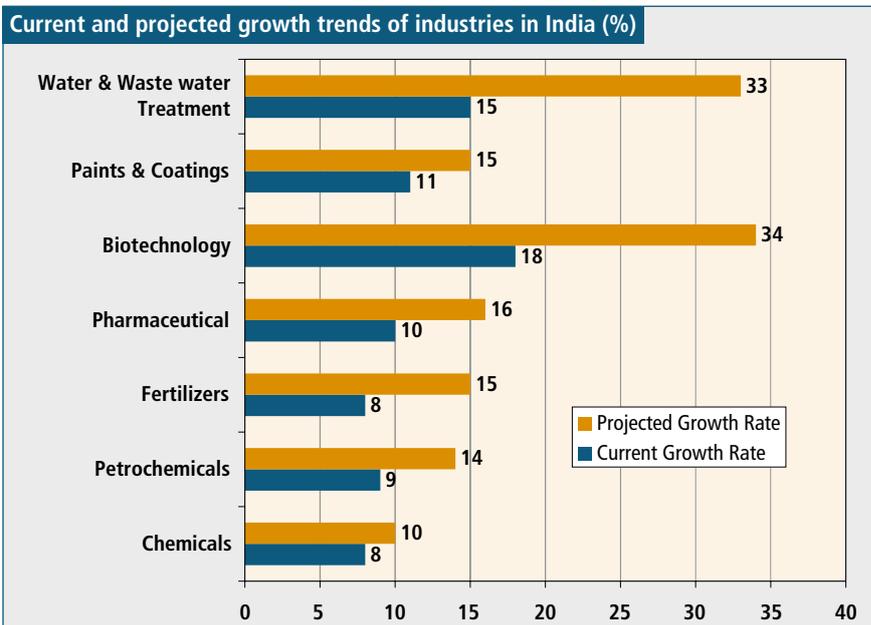
pharmaceutical and biotechnology due to availability of extensive scientific pool in the country in the fields of contract manufacturing, clinical research, generics and drug discovery. This has triggered the demand of high-end technologies such as lab automation etc in this field. India is ranked among the top 12-biotech destinations in the world.

Rapid industrialization has fueled the growth of environment and water segments which are witnessing an increase in demand of new technologies to mitigate emissions and water footprint. India is a lucrative market to set up clean development projects for the developed nations to offset the carbon emissions.

## Technology to drive the growth

Indian chemical process industry is on a rapid expansion mode and has reached the inflection point where technology will be the driver for further industrial growth. It has become mandatory for the manufacturers to offer high-quality products at competitive prices to sustain in the tough business environment. The industry is emphasizing on adopting energy efficient technologies not only to curb the operational costs in the times of increasing energy prices but also to comply with the stringent HSE norms. There demand

[www.chemtech-online.com](http://www.chemtech-online.com)



of automation technologies has increased largely and is registering around 20 percent growth every year. Although the country has a fair amount of indigenous equipment manufacturers and technology suppliers, to bridge the demand-supply gap, the country has to rely on imports.

### **Establishing business networks**

In a bid to facilitate stronger business networks, Chemtech has introduced a Customized International Delegation Program for the participants from various countries to visit the event in Mumbai. The program envisages providing the foreign players an insight into the current trends and demands of the local Indian market.

Chemtech will arrange factory visits and one-to-one meetings as per the requirement of foreign delegates. These visits will help the technology suppliers to understand the trends in the Indian domestic market and add immense value towards taking business decisions. Many international delegations from countries like Germany, Japan, Italy, France, Iran, Egypt and Turkey etc have already sent their confirmation and are keen on interacting directly with the Indian industry to understand the exact needs of the user industry.

### **Strong connecting point**

On the sidelines of the expo, international conferences have always drawn significant industry attention. These conferences have been a connection point between global and Indian industry and provide

a platform to address the critical issues and trends to maintain positive growth momentum.

Chemtech will organize conferences on Innovation, EPC, Pharma biotech, Water, Environment and Industry Automation and Control during the event. These conferences will offer excellent opportunities to understand the prevailing trends and challenges in the Indian market and connect with the leaders from the Indian and global industry. ■

## International Partnerships for Sustainable Technologies and Services for Climate Protection and the Environment – CLIENT

The German Federal Ministry of Education and Research (BMBF) has issued a call for proposals to introduce model projects to help establish and expand international partnerships in research, development and application of environmental and climate protection technologies. Its aim is to establish research co-operations of German-based commercial companies, universities and research institutes and from industry and research and partners in Brazil, Russia, India, China, South Africa and Vietnam. A significant industry participation, particularly of SMEs is required. The call is covering the following topics:

- Climate protection (i.e. reducing emissions of CO<sub>2</sub> in all industry areas)
- Resource efficiency (i.e. environmental protection in production/cleaner production)
- Land management (i.e. land recycling technologies)
- Water management (i.e. regional/urban water resource management)

Funding is generally directed towards German companies and institutions. The grants can be spent to cover the cost of staff, materials, and equipment. The collaborative projects should initially have a duration of three years. The foreign project participants must either receive funding from the partner countries or cover their own expenses. The submission deadline of the detailed project outlines for collaborative R&D-projects will be the 31 August 2011. An additional deadline is set for 31 August 2012. Further information is available at <http://www.bmbf.de/en/furtherance/14892.php>

## Cavallaro Medal awarded to Prof. Michael Schütze

Professor Michael Schütze, head of the Karl-Winnacker-Institut of DECHEMA e.V. in Frankfurt/Germany, has been awarded the Cavallaro Medal of the University of Ferrara. The award is presented by the European Federation of Corrosion every two years on the occasion of EUROCORR, the main European corrosion event, in recognition of a scientist who has made a particularly distinguished contribution to the field of corrosion research. This year's EUROCORR took place in Moscow, Russia from 13 to 17 September 2010. Schütze received the medal for his research and standardisation activities and numerous publications in high temperature corrosion science. He was among the first to discover the halogen effect on the oxidation resistance of intermetallic titanium aluminides. During the last two decades he has developed a comprehensive scientific understanding and a model for this strange, but extremely efficient phenomenon for oxidation protection. Recently the concept was additionally applied to Ni-base alloys. Furthermore, Schütze developed the concept of a quasi-stability diagram describing volatile corrosion products. The application of the diagram has since been extended to the complex situation of gas flows over material surfaces, as encountered under industrial conditions. His recent research activities focus on high temperature corrosion protection without the formation of surface barrier layers (passive oxide layers). It is aimed to prevent the disintegration of aggressive compounds and the up-take of elements into the metal due to this disintegration by catalytic poisoning of the material surface. First intriguing results have been obtained for protection against coking and metal dusting.



## International Conferences organized by DECHEMA

**November, 24, 2010:** Infoday: Catalysis and Unconventional Fossil Carbon Sources, Frankfurt am Main/Germany

**November, 29–30, 2010:** International Workshop "Online sensors for fouling monitoring", Frankfurt am Main/Germany

**January, 18–19, 2011:** System Biology – Between Science and Application, Frankfurt am Main/Germany

**February, 3–4, 2011:** Functional Genomics – Next Generation Applications and Technologies, Frankfurt am Main/Germany

**April, 13–15, 2011:** 14<sup>th</sup> Annual Conference of the European Biosafety Association, Estoril/ Portugal

**April, 27–29, 2011:** EuroPACT 2011 – 2<sup>nd</sup> European Conference on Process Analytics and Control Technology, Glasgow/United Kingdom

**May, 19–20, 2011:** Trends in Metabolomics – Analytics and Applications, Frankfurt am Main/Germany

**June, 5–9, 2011:** 9<sup>th</sup> International Symposium on the Characterisation of Porous Solids – COPS 9, Dresden/Germany

**June, 6–8, 2011:** AIChE-DECHEMA Global Conference on Energy Sustainability in Process Industries, Hong Kong/PR China

**September, 25–29, 2011:** 8<sup>th</sup> European Congress of Chemical Engineering together with ProcessNet-Annual Meeting and EFCE Event No. 693, Berlin/Germany

**September, 25–29, 2011:** 1<sup>st</sup> European Congress of Applied Biotechnology together with DECHEMA's Biotechnology Annual Meeting, Berlin/Germany

**October, 24–26, 2011:** IMRET 12 – 12<sup>th</sup> International Conference on Microreaction Technology, Lyon/France

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