

Wednesday, September 6, 2006

Container transport on a nano scale

Lock one or more molecules up within a cage of nanometer dimensions. Take this 'nanocontainer' to the desired spot and free the molecules. Or keep them locked up for a while and introduce other molecules into the container, for chemical reactions inside. By using polymers containing iron, it is possible to make intelligent containers of which the access of molecules can be regulated in a chemical way. A research team led by prof Julius Vancso of the MESA+ Institute for Nanotechnology has succeeded in fabricating these nanocontainers. The scientists foresee exciting applications in e.g. medicine, in adding additives to food or in ultrafast reactions in nano chemistry. They present their results in the September issue of Nature Materials. A true breakthrough in this research is the use of polymers having iron in their main chain. This is the material the containers are made of. By using iron, for the first time it is possible to adjust the permeability of the material via oxidation and reduction reactions. Scientist Mrs. Yujie Ma and Dr. Mark Hempenius, both of the group of Julius Vancso, succeeded in creating containers that can be opened and closed in this 'chemical' way. Oxidants or reductants take care of the access: an oxidant can be ironchloride, for example, a reductant could even be Vitamine C. Chemical doormen

This selective access – one molecule gets in, the other won't – is the result of the layered structure of the wall of the container. Polymer chains are layered on top of each other and an electrostatic charge keeps them together. Influencing this charge with redox reactions, immediately influences the permeability of the wall. The container can contain a limited number of molecules, a soluble is already present inside. As oxidation and reduction steps take part in numerous biochemical processes in water, the nanocontainers are useful for a variety of biological and biomedical applications. The scientists foresee applications in 'green' areas like food additives, medicine and cosmetics. In a more fundamental way, nanocontainers could be used in biochemistry to study large numbers of enzyme reactions at the same time and with high throughput. The research, led by prof. dr. Julius Vancso of the MESA+ Institute for Nanotechnology of the University of Twente, has been done in close cooperation with the Group of prof. Helmuth Möhwald of the Max Planck Institut für Kolloid- und Grenzflächenforschung in Golm. The article 'Redox-controlled molecular permeability of composite-wall microcapsules' is published in the September issue of Nature Materials, www.nature.com/nmat More information about the research of prof. Vancso's Group can be found at <http://mtp.tnw.utwente.nl/> Source: Universiteit Twente

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Tuesday, September 5, 2006

Berliner Nanotechnology Company Doubles Turnover

The Berlin Capsulation NanoScience AG completed the first half of 2006 by doubling the previous year's turnover in the same period, while at the same time Capsulation's EBIT increased to more than TEUR 200. Capsulation was able to enter a positive overall result in the ledger and is looking forward to an auspicious future. By the end of 2006 sales revenues of well over 1 million EUR are expected. Alexander Hermann, chief financial officer, states: "We are pleased to have surpassed the goals we aspired to, for this generates a high degree of confidence in the company's growth forecasts among all involved: customers, staff and investors. In the coming months the result will be impaired by high advance costs in the R & D area, especially due to scheduled pre-clinical experiments. However, the successful conclusion of these tests promises a considerable increase in turnover in the next fiscal year, as a large number of potential pharmaceutical customers hold them to be an important milestone for expanding and intensifying business relations with Capsulation." Capsulation NanoScience AG is a leading nanotechnology company focusing on the development of tailor-made drug delivery systems and other innovative life science products based on tunable nano-sized capsules. The company applies its worldwide-patented so-called LBL-Technology®. Based on their minute size, their functionality and their highly reproducible production process the tunable capsules can be used for a multitude of different applications. Accordingly, the precisely sized capsules can be made to function in a manner to suit the intended application, and can be given the appropriate biochemical, electrical, optical and magnetic properties as required by the customer. In order to meet customers needs for complete product solutions Capsulation has recently designated EBARA Corp. as the preferred developer, manufacturer and distributor for automated LBL-units. Only six month after the signing of the licence agreement, EBARA has started operation of the first prototype plant (LBL-Unit®) for the manufacture of Capsulation's LBL capsules. In 2005, renowned growth consultants Frost & Sullivan have awarded the year's "Product Differentiation Innovation Award" in the global nanobiotechnology market to Capsulation NanoScience AG, Berlin. The company has received the award for the innovative and diverse use of their proprietary nanobiotechnology product platform, which can be implemented in various life sciences applications. Source: Verivox

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Monday, September 4, 2006

Trends in Nanotechnology - TNT2006

One of the main objectives of the Trends in Nanotechnology conference is to provide a platform where young researchers can present their latest works and also interact with high-level scientists. For this purpose, 76 grants (travel bursaries) were available in 2005. In addition 28 prizes (around 8000 Euros) to best student posters were awarded. More than 60 senior scientists were involved in the selection process. Grants and awards were funded by the TNT Organisation in collaboration with an increasing number of Research Institutions and Industrials involved in Nanotechnology. TNT2006 is being launched following the overwhelming success of earlier Nanotechnology Conferences. The TNT2006 edition will be organised out of Spain for the first time - Grenoble (France) - to emphasise the importance at the European level of the launch of the Centre of Innovation in Micro and Nanotechnology, MINATEC. This centre, to be inaugurated in June 2006, came into existence at the instigation of CEA-LETI Grenoble and Institut National Polytechnique Grenoble and its ambition is to become Europe's top centre for innovation and expertise in micro & nanotechnology. TNT2006 "Trends in Nanotechnology" (04-08 September, 2006) will be held in the brand new congress facilities of the Micro & Nanotechnology House within the MINATEC complex. The TNT2006 structure will keep the fundamental features of the previous editions, providing a unique opportunity for broad interaction. TNT2006 will be organised by the following institutions: Phantoms Foundation, Universidad de Oviedo, Universidad Autónoma de Madrid, Consejo Superior de Investigaciones Científicas, Universidad Carlos III de Madrid, Universidad Complutense de Madrid, Donostia International Physics Center, NIMS, University of Purdue, Georgia Tech. and CEA-LETI-DRFMC. Organiser: Phantoms Foundation Contact details: Dr. Antonio Correia Phantoms Foundation UAM - Campus de Cantoblanco Madrid 28049 Spain E-mail: antonio@phantomsnet.net Fax: +34 91 4973471

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