

NEWSLETTER

Breakthrough of new Networking between European Materials Research Centres

Welcome

Welcome to the third issue of ENMat Newsletter. ENMat has been founded in September 2005, to create a powerful network of leading Materials Research Centres in Europe. We expect to stimulate beneficial interdisciplinary activities between members of the network as well as to increase the efficiency of the transfer of results from R&D to industry. We also expect to improve opportunities for participation in activities in the frame of EU-FP7 within joint projects.

Highlights in this Newsletter

Description of ENMat members in Switzerland (CCMX) and Italy (DIMP) - page 2

ENMat International Projects - page 3

WUT - EMPA Bilateral Project - page 4

COST ACTION FA0904 - page 5

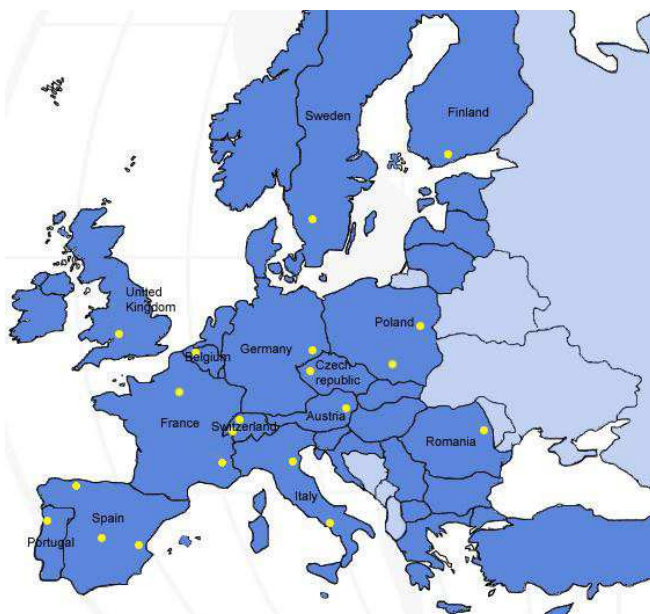
COST ACTION MP0701 STSM report - page 6

Interesting events - page 6



Members

- AIDICO, Construction Technology Institute, Valencia, Spain
- AIT Austrian Institute of Technology, Seibersdorf, Austria
- Centre for Materials Science and Engineering (CMSE), Ghent University, Ghent, Belgium
- Centre for Research and Development of Materials and Technologies (CRDMT), Prague, Czech Republic
- Competence Centre for Materials Science and Technology (CCMX), Ecole Polytechnique Fédérale de Lausanne, Switzerland
- Department of Chemistry and Technology of Polymers, Cracow University of Technology (CUT), Cracow, Poland
- Department of Materials and Production Engineering, University of Naples "Federico II", Napoli, Italy
- Department of Metallurgy and Materials, University of Birmingham, Birmingham, UK
- Empa - Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland
- Fraunhofer Institute for Ceramic Technologies and Systems (IKTS), Dresden, Germany
- French Atomic Energy Commission (CEA), Grenoble, France
- Fundacion ITMA, Llanera, Spain
- Institute of Mechanical Engineering and Industrial Management (INEGI), Porto, Portugal
- Institute of Science and Technology for Ceramics (CNR-ISTEC), Faenza, Italy
- Materials Design Division, Warsaw University of Technology (WUT), Warsaw, Poland
- "Petru Poni" Institute of Macromolecular Chemistry, Iasi, Romania
- SP Technical Research Institute of Sweden, Borås, Sweden
- Universidad Complutense de Madrid, Madrid, Spain
- Université Paris-Est Créteil, Paris-Est, France
- VTT Technical Research Centre of Finland, Espoo, Finland



ENMat Members - CCMX

CCMX - Competence Centre for Materials Science and Technology, Switzerland

CCMX was initiated at the national level in Switzerland in early 2006. It aims to serve the interests of the country in the field of materials science in terms of research, education and technology transfer by reinforcing ties between academia, industry and the Swiss economy.

CCMX federates the strengths of four ETH Domain institutions (EPFL, ETH Zurich, Empa, PSI) and of CSEM, and involves the active participation of partners from industry, from industrial associations and from Swiss universities.

At the core of the Centre's activities are Education and Research Units divided in the following domains:

- Surface, coatings and particles engineering
- Materials for the life sciences
- Metallurgy

Closely linked to these Education and Research Units is an Analytical Platform developing and promoting activities in nano- and microscale materials characterisation for industry and academia.

Research Programme

The CCMX Research Programme is designed to foster Public-Private Partnerships in materials science in order to ensure the longevity of the interactions between industry and CCMX institutions. Instead of engaging in research on a project-by-project basis as it has been in the past, industrial partners collaborate with academic groups in a consortium focusing on a selected "Thematic Research Area".

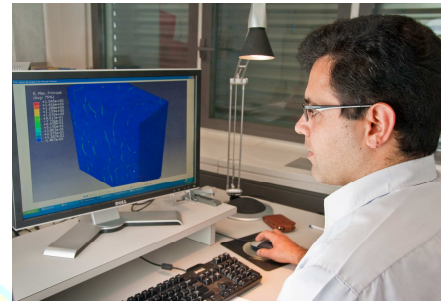


Education and networking

A wide range of continuing education is offered by CCMX. Courses, seminars and workshops are regularly organised. Topics are chosen based on the actual needs of the targeted audiences (PhD students, engineers, scientists from industry and/or academia). CCMX also organizes events which focus on knowledge transfer and networking by allowing participants to meet and discuss materials science in all its different aspects. The main networking events organised by CCMX are "Technology Aperitifs". These end of afternoon/early evening events consist of scientific presentations on a particular topic followed by an informal aperitif where people can meet and talk.

CCMX aims to strongly and positively influence materials science in Switzerland by building a Swiss reservoir of expertise in the field of materials science. It builds bridges between the scientific and industrial communities and addresses targeted specific needs with particular emphasis on developments of interest for the applications of tomorrow.

More information: www.ccmx.ch



ENMat Members - DIMP

DIMP - Department of Materials and Production Engineering of the University of Naples "Federico II"

The Department of Materials and Production Engineering (DIMP) of the University of Naples Federico II is recognised as a leading European academic institution in the field of Materials Science and Engineering. The DIMP co-ordinates research in various areas spanning from inorganic to organic (macromolecular materials) for both basic science and industrial applications.

The research concerns all aspects of the relationships between composition, structure, processing and properties of materials. More than 200 persons, including 50 professors (permanent staff) and more than 150 researchers are working in the Department. A strong interactive network between the DIMP, CRIB (Interdisciplinary Research Centre in Biomaterials University of Naples), and IMCB (Institute of Material Composite and Biomaterials, of Italian Research Council CNR), other international institutions (IRC in Biomedical Materials, University Polytechnica de Catalunya, Barcelona, Spain) and many materials companies exists, ensuring the effective transfer of technical results to solve technological problems.

Projects within the DIMP involve both basic science and novel technological development. DIMP has been and is coordinator of several joint multidisciplinary national and international research projects and builds a platform for consulting/discussion regarding the vision on education and research in the field of materials science.

Activities :

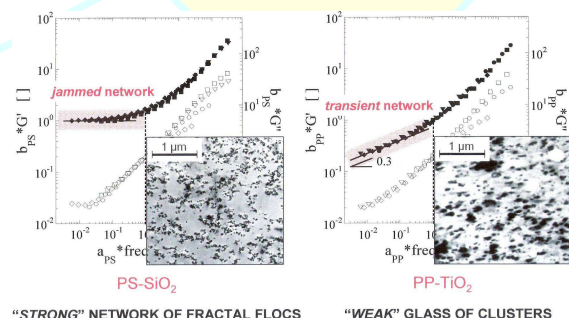
- Education in the field of materials science and technology: general training activities, but also specialised continuing education and organisation of workshops and conferences with regard to modern developments in materials science.
- Research and development in the field of materials science and technology and the industrial applications on doctoral and post-doctoral level: applying research results in order to obtain material

developments leading to products with a high added value; materials innovation; stimulating the interdisciplinary and multidisciplinary research (properties, structure, applications, processing, modeling) in order to develop new materials, find new applications, optimisation of materials,

- Service providing to the industry: offering a performant research infrastructure and research logistics, including scientific services; technology transfer in general.

Actual research domains concerning materials technology :

- Synthesis and characterization of: Polymers, Polymeric Fibres and Nanofibres, Composites, Nanoparticles, Nanocomposites and Hybrid Materials, Ceramics
- Material Processing
- Biomaterials
- Metallurgy and Microscopy
- Metrology and Reverse Engineering
- Mechanical Characterisation
- Production Management and Engineering



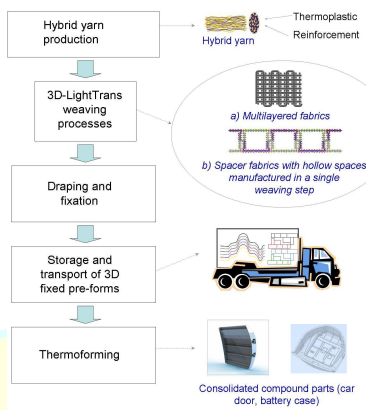
Web page: <http://www.enmat.eu>

ENMat International Projects

FP7 NMP Large Collaborative Project – 3D-LightTrans

Large scale manufacturing technology for high-performance lightweight 3D multifunctional composites

The goal of the 3D-LightTrans project is to provide groundbreaking, highly flexible, efficient and adaptable low-cost technologies for the manufacturing of integral large scale 3D textile reinforced plastic composites, including innovative approaches for the individual processes and its integration in complete manufacturing chains, which will enable to shift them from its current position in cost intensive, small series niche markets, to broadly extended mass product applications, not only in transportation, but also in other key sectors, like health and leisure.



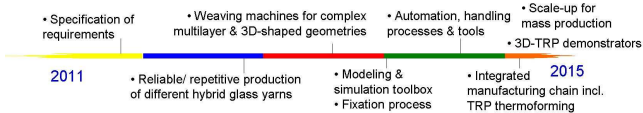
3D-LightTrans manufacturing chain

large scale 3D composites. 3D-LightTrans will open the way to a totally new concept for the design, manufacturing and application of composites for low-cost mass products in a wide range of sectors.



Cost improvement to be achieved with 3D-LightTrans

The Consortium brings together multidisciplinary research teams involving European leading companies, including industrial stakeholders from machine tools and machine automation and several OEM active in the field of processing of flexible materials and composite manufacturing, as well as from the application sector, and extensive expertise from well known research specialists in the area of materials, production research and technical textiles in particular.



Project timeline and scheduled results

Start date : 01/04/2011

Project duration : 4 years

More information:

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URL: <http://www.3d-lighttrans.com/>

Web page: <http://www.enmat.eu>

FP7 NMP Coordination Action – 2BFUNTEX

Boosting collaboration between research centres and industry to enhance rapid industrial uptake of innovative functional textile structures and textile-related materials in a mondial market



2BFUNTEX will exploit the untapped potential in functional textile structures and textile related materials. It will bring together all innovation actors in the field fostering a multidisciplinary approach between universities, research institutes, SMEs and sector associations. The 2BFUNTEX team will identify technological gaps and eliminate barriers resulting in a faster industrial uptake of added value functional materials with new functionalities and improved performance and resulting in creation of new business worldwide.

Technological needs will be mapped, new joint international research disciplines will be identified and multidisciplinary lab teams will be created. International cooperation will be favoured to exploit the worldwide market expansion potential. Industry will be involved at all stages of the process. The inventory will enlarge the team of important textile universities and renowned materials research centres and will identify new collaborations. Synergy will be reinforced and created which will enable to identify and develop new functional materials.

Training materials regarding functional materials for research and industrial purposes will be developed and implemented to allow a common language regarding functional textile structures and textile related materials, and will increase the number of well-trained people in this field.



Further, the 2BFUNTEX partners will organise and participate in conferences, workshops and brokerage events. Along with a website with an extensive database comprising all information gained throughout the project, collaboration will be boosted and rapid industrial uptake catalysed and enhanced.

The project duration will be 4 years and the consortium includes 26 partners from 16 countries.

Start date : 01/01/2012

More information:

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WUT - EMPA BILATERAL PROJECT

Novel nano-composites filter media for adsorption based water treatment – NANOSORP Polish-Swiss Research Programme

Partners:

Warsaw University of Technology, University Research Centre “The Functional Materials”

AGH – University of Science and Technology

EMPA, Materials Science and Technology

EAWAG, The Swiss Federal Institute of Aquatic Science and Technology

The global water demand is one of the main challenges of the 21st century. At this moment, over 900 million people lack access to safe drinking water [1]. The worldwide accepted Millennium Development Goals (MDG's) aim at reducing this number by 50% in 2015. The growth of the world population increases pressure on agriculture and more water is needed for irrigation. It is expected that the world population amounts to almost 8 billion by the year 2025, with the developing world's share rising from 79% to 82%. The major user of water is agriculture (70% of all consumed water, industry 22% and domestic users 8%). In order to cope with the demand of water for agricultural applications, wastewater is increasingly used. In several countries suffering water stress (e.g. Israel), wastewater is recycled for irrigation after extensive treatment. Such treatment processes usually include multi-stage filtration schemes. In many developing countries however, wastewater is used directly without treatment, which causes a major risk for public safety and health by distribution of pathogens and pollutants.

Although suitable water and wastewater treatment processes exist, they are not applied in all cases which, among other factors, is related to the costs and the complexity of such processes. This does not only apply for developing countries, but also for industrialized countries. From 877 million people living in Europe today 140 million do not have access to a sufficient water supply and almost 20 million do not have adequate sanitation, with the problem being mostly centered in Eastern Europe. The countries with the largest water problems are Romania, where only 54% of the population has a water supply, and Bulgaria, where 20% of the people have water cut off during the summer. Furthermore, many Mediterranean and South-European countries suffer from water stress, leading to critical situations in summer when the demand for agriculture and domestic use is peaking.

It therefore can be concluded that there is a need for cost-effective and straightforward treatment methods, and that this need will increase in future. For the removal of suspended materials and pathogens, filter materials are essential. Existing filter materials are either relatively expensive (e.g. membranes) or suffer from other disadvantages such as incomplete pathogen removal, large footprints, high maintenance requirements, high energy demand etc. [2]. Thus, new low-cost filter materials are required which can be tailored for specific applications in the water and wastewater sector.

Fiber based non-woven filter materials can provide a high throughput (flux) and can be produced at low cost, typically for a price of a few Euro per filter cartridge, but suffer from other disadvantages including limited lifetime due to fouling and incomplete rejection of submicron particles and pathogens. In the proposed project, material developments will be carried out in several directions to overcome these limitations.

The goal of this project is to develop innovative polymer-inorganic composite filter materials and membranes for water treatment. These materials can be mass-produced and are based on low-cost technologies and materials. Therefore, they can be suitable for a wide range of applications for water and wastewater treatment not only in industrialized countries but also in transition and developing countries.

Both polymer-based deep bed filters and capillary membranes will be investigated and further developed using ceramic nanoparticles as well as surface modification technologies.

- The main focus of the project is on **deep bed filters**: The advantages of deep bed filters in comparison to other filter materials and ultrafiltration membranes include very high flux and low production costs. Disadvantages in comparison to membranes include the non-absolute rejection of pathogens and the potential of internal clogging (fouling and biofouling). Therefore, the research will focus on material properties and process engineering developments to overcome these

limitations. Both melt-blown and UV-cured polymer fiber filters will be investigated, which are capable to reject suspended solids and bacteria down to a size of 0,5 µm. In order to improve rejection of viruses, adsorbing ceramic nanoparticles will be included onto the surface of the fibers. Furthermore, nanoparticles with additional antiseptic or heavy metal adsorbing capacity will be studied. It is expected that the synergetic action of microporous polymer structures and nanoscale ceramic adsorbents will provide a significant reduction of biological risks. Also, highly hydrophilic nanocomposites will be investigated to reduce the fouling potential of the filters. Furthermore, the composites will be transformed into pure inorganic filters by debinding / sintering. This yields a filter material which can be regenerated and cleaned with thermal methods, thus reducing the effects of fouling and improving the life time of the filters.

- Capillary membranes: a more explorative part of the project focuses on modifying capillary microfiltration membranes using different types of nanoparticles. Two different functionalities are envisaged: pathogen inactivation by surface-bound nanoparticles, and membrane cleaning by inclusion of nanoparticles.

The range of potential applications in the water sector is broad, and can be roughly subdivided in three categories: (I) pre-treatment, (II) post-treatment and (III) direct water treatment:

- I. pretreatment includes solids removal from wastewater before irrigation; pretreatment before sea water desalination (Reverse Osmosis) in order to protect membranes from fouling; pretreatment of heavily contaminated surface- or ground-water in order to protect ultrafiltration membranes
- II. post-treatment of biological wastewater treatment effluent in order to remove solids, reach improved hygienisation and reduce the nutrient content of the effluent
- III. one-step direct water treatment for removal of suspended materials and pathogens for drinking water production;

The criteria for the materials are different for each type of application. For example, for pre-treatment, hygienic aspects might be not very relevant, while for direct one-step water treatment the removal of all pathogens is essential. For other applications (e.g. RO pretreatment), prevention and abatement of membrane fouling is essential. Thus, the developed materials will be tested focusing on the broad spectrum of applications. The focus of testing and process development will be adapted depending on the specific characteristics of the materials, and on studying and optimizing internal fouling behavior. Processes with a good perspective of application will be tested in more detail and developed so that feasibility for application on a large scale can be evaluated.

References

- [1] WHO, 2004, Meeting the MDG drinking water and sanitation target; A midterm assessment of progress. World Health Organization and United Nations Children's Fund
- [2] Peter-Varbanets M., Chris Z., Swartz C., Pronk W. Decentralized systems for potable water and the potential of membrane technology. Water Research 43 (2009) 245-265.

Supported by a grant from Switzerland through the Swiss Contribution to the enlarged European Union.

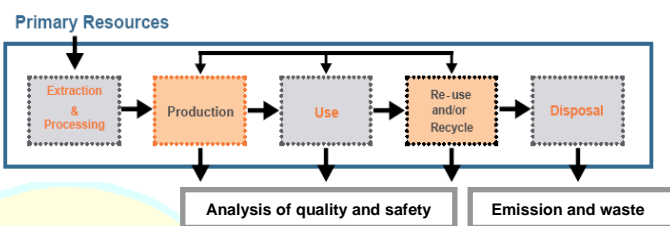


COST ACTION FA0904

Eco-sustainable Food Packaging based on Polymer Nanomaterials 2010-2014 COST Action FA0904

The main objective of COST Action FA0904 is to constitute an international scientific and technological network on issues related to eco-sustainable polymer nanomaterials for food packaging (PNFP). This is important for the preservation, conservation and distribution of high quality and safe food. It aims to exploit the potential of polymer nanotechnology in the area of food packaging and to meet the new needs of efficiency and effectiveness, environment, health and safety, taste and cost. The approach will be to consider the complete life cycle of the PNFPs by the combined effort of leading research and industrial groups. Participants will identify the barriers (in research and technology, safety, standardisation, trained workforce and technology transfer) that may obstruct a successful development of PNFP and will indicate the strategies necessary to progress. 27 COST countries are already involved, including 2 non-COST countries (USA and Canada).

Complete Life Cycle of Polymer Nanomaterials



The Action is organised into four Working Groups (WG):

WG1: Development of new safe PNFP, covering such topics as synthesis and production of matrices, nanoparticles and nanodevices, surface functionalisation and chemical treatments, implementation of characterisation and metrology.

WG2: Development of new processing technologies, covering such topics as coating, extrusion, dispersion, exfoliation, as well as process-control, scale-up and modelling tools.

WG3: Development of new strategies to identify any critical interactions of PNFP with food, covering topics such as food safety and risk assessment.

WG4: Ethics, standardisation and public engagement, covering such topics as communication with major stakeholders, risk policy in general, research ethics, technology governance, standardisation and the conceptual frameworks of product life cycle and precaution.

The first year of activity in this Action has been extremely fruitful. **The Action has fully achieved its objectives and technical goals.** The main activities already performed are listed in the table below.

Date	Place	Type	Title
28 - 29 June 2010	Iasi (RO)	Conference	"Ecosustainable food packaging based on polymer nanomaterials"
1 - 2 September 2010	London (UK)	Technological seminar	"Polymer Nanomaterials for Food Packaging: Characterization Needs, Safety & Environmental Issues"
3 - 4 March 2011	Pozzuoli-Napoli (IT)	Workshop	"Safe nanostructured polymer materials: Characterization and new processing technologies"

Short Term Scientific Missions - STSM

It is well known that the COST Action gives the chance to young scientists (early stage researchers (ESR), a ESR is defined as PhD + max. 10 years) to have a working experience abroad by Short-Term Scientific Missions (STSM). These Missions (Exchange Visits) are aimed at strengthening the existing networks by allowing scientists to go to an institution or laboratory in another COST FA0904 member state, to learn a new technique or to take measurements using instruments and/or methods not available in their own institution. Interested applicants must use the on-line registration tool (<http://www.cost.esf.org/stsm>) and submit his/her full application to the STSM coordinator Prof. Cornelia Vasile (cvasile@icmpp.ro) or to the Chair of the Action Dr. Clara Silvestre (silvestre@ictp.cnr.it).

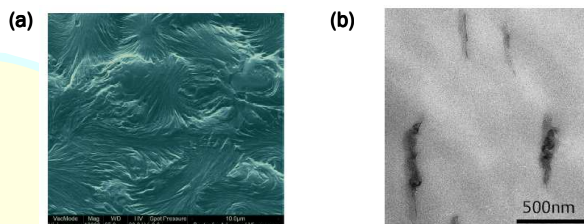
Innovative networking

Very strategic and innovative activity of the Action is the establishment of synergies with European networks/projects acting in the same area of interest, for exchange of the best practice and combination of events. To be mentioned are the links with the FP7 project Napolynet "Setting up research-intensive clusters across the EU on characterization of polymer nanostructure" with Dr. Silvestre (Action chair) as Coordinator and several COST MC members as partners: with organization of two joint events *Technological Seminar "Polymer nanomaterials for food Packaging" 1-2 September, London 2010*, *International Workshop "Safe nanostructure Polymer nanomaterials" 3-4 March, Pozzuoli 2011*.

The joint organization avoiding overlaps and optimizing the budget resources made it possible to invite several top level speakers; to increase the number of participants and in particular the number of grants for young researchers; to attract scientists from different disciplines, e.g. biotechnology, food technology, composites, nanotechnology, toxicology, and enabling participants to meet scientists they do not meet in their regular network, stimulating new contacts and eventually new multidisciplinary initiatives.

Innovative knowledge resulting from COST Action activity

Innovative knowledge resulting from COST Action activity is in progress. The preliminary results are very encouraging. Some innovative results were already obtained: to mention - in the case of isotactic polypropylene containing either inorganic nano-platelets to increase the tortuosity of the gas paths or spherical particles which provide anti-microbial properties - the identification through designed and implemented special experimental apparatus (quantitative scattering techniques complemented with scanning, transmission electron and scanning probe microscopy) of the shape (plate-like or spheroidal) and minimum number of nanoparticles required to influence the polymer matrix and the range of processing conditions.



The images show the complex morphology at nanometric dimension which exists in films of polypropylene (a) and polypropylene with embedded clay nanoparticles (dark objects) (b) used for food protection. The inclusion of the nano platelets significantly reduces oxygen diffusion in the film which is critical for food applications. (Prof. Geoffrey Mitchell, University of Reading, UK)

Event

The first activity for the second year of COST FA0904 was the International workshop "Novel nanostructured polymeric materials for food packaging and beyond". It has been organized at the VTT Technical Research Centre of Finland, Espoo, FINLAND on September 15-16 2011. More information: Dr. Mika Vaha-Nissi (mika.vaha-nissi@vtt.fi).

It is recalled that the main goal of WG1 (Development of new safe PNFP) is to consider new polymer nanomaterials for food packaging - also from other applications - and breakthroughs and knowledge leading to new features gained through nanotechnology. The presentations are preferably belonging - but not limited - to one of following topics:

- 1) Selection, synthesis, production of matrix, nanoparticles and -devices,
- 2) Surface functionalization and chemical treatments of nanoparticles,
- 3) Link between nanostructures and macroscopic properties,
- 4) Characterization and measurement tools.

More information on COST Action FA0904:

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COST ACTION MP0701 STSM EXCHANGE

Interactions between polymer and palm-oil components on SMI/oil organic nanoparticle systems

Report on the stay of a young researcher from Suleyman Demirel University (Turkey) at Ghent University/Department of Textiles (Belgium) with a COST MP0701 STSM grant.

The textile laboratory at Ghent University has research activities involving more and more research having a clear multidisciplinary character and introducing several new technologies. For example, research into advanced materials for niche applications, where the unique quality and functional properties of the material are decisive for success. Additionally, the stay at the Department contributed to the scientist's development sharing the experience gained over the years.

Suleyman DEMIREL University (SDU) was founded in 1993 and had the biggest capacity in the new-founded universities with four junior colleges, four institutes and twelve faculties. Next to education, another issue that had a considerable importance for the impact of the university on young scientists was certainly the academic atmosphere that was created in the campus. SDU has signed an Erasmus exchange agreement with Ghent University since a few years already. However, this is the first exchange visit from SDU within the COST MP0701 STSM programme.

The host at the Department of Textiles, Ghent University was Prof. Dr. Gustaaf Schoukens. The researcher was Dr. Aysegul Uygun from SDU. The research performed was aimed at investigating interactions between polymer and palm-oil components on SMI/oil organic nanoparticle systems. Poly(styrene-maleic anhydride) (SMA) copolymers and their imidisation products (SMI) are useful materials for industrial coatings because of their functionality and chemical reactivity. The functional nanoparticles with excellent properties, such as a high specific surface area and functional groups in nanospheres, make them more favorable to be used as active surface coating components. Chemical interaction or

binding between the organic polymer phase and oil phase is an important parameter to show the stability of encapsulation. Therefore, the aim of the research was to explain the interactions between encapsulated polymers and oil nanoparticles using different methods. A series of organic nanoparticles synthesized by imidisation of poly(styrene-maleic anhydride) copolymers in the presence of bio-renewable palm oil were refluxed using different solvents such as toluene and petroleum ether. All extracts were analyzed with weight difference, Raman and FTIR spectroscopy and DSC analysis.

The collaboration with the host institution will continue based on the present work and should lead to a manuscript based on the results, and to further cooperation within a new COST Action.



Dr. Aysegul Uygun would like to thank the COST MP0701 STSM Coordinator Prof. Francesco Branda, the Chair of the action MP0701 Dr. Erich Kny, and Prof. Dr. Gustaaf Schoukens for giving her this opportunity, and many thanks to Mrs. Els Van der Burght for her support.

EVENTS

- 20-23 March 2012, Potsdam, Germany
EURO Bio-Inspired Materials 2012 International School and Conference on Biological Materials Science
URL: <http://www.dgm.de/dgm/bio-inspired>
- 27-29 March 2012, Paris, France
JEC Europe 2012 Composites Show & Conferences
URL: <http://www.jecomposites.com>
- 27-28 March 2012, Berlin, Germany
5th International Conference on Silicone Elastomers
URL: <http://www.ismithers.net/downloads/conferences>
- 16-20 April 2012, Graz, Austria
WFC11 : 11th World Filtration Congress
URL: <http://www.wfc11.at/>
- 6-9 May 2012, Bruges, Belgium
I-SUP2012 : International Conference on Innovation for Sustainable Production
URL: <https://www.i-sup2012.org/Pages/home.aspx>
- 14-15 May 2012, Espoo, Finland
Final Event COST MP0701 : International Workshop on Polymer Nanocomposites
- 17-18 May 2012, Izmir, Turkey
EGE MEDITEX 2012 : International Congress on Healthcare and Medical Textiles
- 20-23 May 2012, Dresden, Germany
10th CMCEE : 10th International Symposium on Ceramic Materials and Components for Energy and Environmental Applications
URL: <http://www.cmcee12.de/>
- 4-6 June 2012, Lausanne, Switzerland
ETCC 2012 : 1st European Technical Coatings Congress
URL: <http://www.etcc2012.ch>
- 10-14 June 2012, Ischia, Italy
6th International Conf. on Times Of Polymers (TOP) & Composites
URL: <http://www.topconference.it/>
- 11-13 June 2012, Wrexham, UK
ACMTAA-2012 : 2nd International Conference on Advanced Composite Materials and Technologies for Aerospace Applications
URL: <http://www.acmtaa.org/>
- 13-15 June 2012, Zadar, Croatia
AUTEX conference 2012: Innovative Textiles for high future demands + 2BFUNTEX Kick off conference on Innovative Functional Textiles
URL: <http://www.autex2012.ttf.unizg.hr/>
- 19-20 June 2012, Fellbach bei Stuttgart, Germany
Biobased materials - WPC, Natural Fibre and other innovative Composites Congress
URL: <https://www.hanser-tagungen.de>
- 19-21 June 2012, Aarhus, Denmark:
Industrial Technologies 2012 : biannual congress in the field of industrial technologies (nano, materials and production)
URL: <http://industrialtechnologies2012.eu/>
- 24-28 June 2012, Venice, Italy
ECCM15 : 15th European Conference on Composite Materials
URL: <http://www.eccm15.org/>
- 2-4 July 2012, Bedfordshire, UK
NanoStruc 2012 : International Conference on Structural Nano Composites
URL: <http://www.cranfield.ac.uk/sas/automotive/events/nanostruc>
- 23-27 July 2012, Lausanne, Switzerland
Junior Euromat 2012
URL: <http://www.dgm.de/dgm/junior-euromat/index.php>
- 10-14 September 2012, Garmisch-Partenkirchen, Germany
PSE 2012 : 13th International Conf. on Plasma Surface Engineering
URL: <http://www.pse-conferences.net/pse2012.html>
- 12-14 September 2012, Guimaraes, Portugal
TRS 2012 : The 41st Textile Research Symposium
URL: <http://trs2012.org/>
- 13-14 September 2012, London, UK
FRP Bridges 2012
URL: <http://www.netcomposites.com/Events.aspx>
- 19-21 September 2012, Dornbirn, Austria
51st DORNBIRN MAN-MADE FIBERS CONGRESS
URL: <http://www.dornbirn-mfc.com/en/tagung/naechstetagung.asp>
- 25-27 September 2012, Darmstadt, Germany
MSE 2012 - Materials Science and Engineering
URL: <http://www.dgm.de/dgm/mse-congress>

Web page: <http://www.enmat.eu>