

FCT Relatório Científico 2011 Print: 27-03-2012 19:36:59 [Materiais Têxteis e Papeleiros]

General Information

Name of Research Unit: (CTM-Centro-195)
Materiais Têxteis e Papeleiros

Coordinator: Manuel Jose dos Santos Silva

Main Scientific Domain: Ciências e Engenharia de Materiais

Other Subdomains: n/a

Host Institutions

Leading Host Institution: Universidade da Beira Interior

Other Institutions Involved:

Objectives & Achievements

Unit Description

Organic of the Unit:

- Scientific Coordinator: Prof. Manuel José dos Santos Silva

Competences: To superintend, orientate and co-ordinate R&D activities. Head of the Scientific Council. Responsible of the external contacts.

-Scientific Council (includes all PhDs researchers in the Unit)

Competences: To define research strategies. To judge and approve the financial reports, reports on activities, budgets and plans of activities.

-External Advisory Board:

. Prof. Albert Manich Bou – Consejo Superior de Investigaciones Científicas – Barcelona

. Prof. Maria Margarida Lopes Figueiredo – Faculdade de Ciências e Tecnologia – Universidade de Coimbra

. Prof. Jean-Yves Drean – Université de Haute Alsace-ENSISA

. Prof. Mohamed Naceur Belgacem - Université de Grenoble

- Prof. Maria Elisabete Cabeço Silva – Universidade do Minho

Competences: To advice about Unit activities. To judge the research performance of the Unit based on the annual reports on activities and plans of activities.

- Principle Investigators:

Objectives & Achievements

- . Textile Materials Area - Prof. José Mendes Lucas
- . Paper Materials Area – Prof. Rogério Manuel dos Santos Simões
- . Fundamental Sciences Area – Prof. Ana Maria Carreira Lopes

Competences: To assist the Scientific Responsible and propose the annual and pluriannual plans of activities.

- Administrative Coordinator

Competences: To ensure the Unit administrative management. To do the budgetary management and control, taking account the financing imputed to the Unit and according to the items of the budget plan.

General Objectives

The objectives of the Research Unit are to carry out fundamental and applied research in the areas of Textile and Paper Sciences and Technologies, aiming to contribute to the development and sustainability of these two important sectors for the Portuguese economy.

Mission and general activities include:

- Project development for the optimisation of all processes and technologies involved in the textile and paper manufacturing industries, to improve materials and final products, always bearing in mind ecological issues.
- Development of new materials, technologies and processes.
- Making use of by-products.
- Encouraging scholarship and training among researchers, raising scientific standards to the levels of counterpart European Research Centres.
- Development of research activities in collaboration with various national and international companies and institutions.
- Contributing to the protection of the environment by promoting the use of clean technologies and of non-polluting products.
- Promoting productivity, quality, and competitiveness in the textile and paper industries.
- Promoting national scientific potential, the economic development of the region and of the country, and a more assertive market approach by the textile and paper industries.

Specific research lines of the three groups inside the Unit (Textile; Paper; and Fundamental Sciences) include:

Textile Materials:

- Textile Materials, Health and Well-Being. Improving healthcare and functionality.
- Materials, processes and environment; recycling waste from textile and paper industries.
- Developing nanotechnology, specifically nanofibre production.
- Developing wearable textiles prototypes with sensorial and communication capabilities.
- Textile and clothing mass customisation. Design and product development.

Objectives & Achievements

Development of new fashion complements improving multifunctionality by using design, modelling and garment making.

Paper Materials:

The research subjects covered by the paper group are biorefinery and pulping, papermaking and printing science and technology.

Regarding to biorefinery, we have initiated the cellulose nanofibrils production, and extract and characterize bioactive compounds in biomass.

In the pulp and paper field, we intend to continue exploring the potential of enzymes for pulp delignification and to decrease energy consumption in refining.

The work on paper modelling and ink-jet printing will continue.

Fundamental Sciences:

The research developed by the Group includes several projects with the following objectives:

Reduce contaminants in several types of effluents using aerobic and anaerobic bioreactors, adsorption, anodic and photoelectrocatalytic oxidation.

Perform chemical evaluation of the biologic activity of Angola medicinal plants.

Develop new stationary chromatography cellulose supports.

Develop robust and accurate numerical methods and techniques for the simulation of non-Newtonian flows.

Main Achievements during the year of 2011

The research activities of the Unit are organized in 3 Groups: Textile; Paper; and Fundamental Sciences. The first two groups are more motivated to applied research, having established cooperative relationships with the local and national Textile and Paper industries. The third group serves as support to the activities of the former groups, giving answers to their needs related to fundamental knowledge in Chemistry, Physics and Engineering (Mechanical; Electromechanical) areas. It is therefore expected that the Textile and Paper groups have a stronger activity in applied projects linked to specific needs of the industries, but still with a very impressive scientific activity, while the Fundamental Science group develops a more standard ID research with view to publish the outcome of that research in scientific journals.

The following is a summary of the outcome of Applied Projects connected to industrial needs:

Textile group

- Development of wearable textiles prototypes will combine research in functional textile materials incorporating sensorial and communication capabilities aiming comparison of acquired signals to electromyography and ECG commercial devices.
- Development of woollen fabrics having added functionalities coming from the blend of wool and PLA fibres with specific and complementary properties according the end use.
- Advances on research on textile and clothing mass customisation. Design and product development.
- Advances on biomedical textiles – an electro textile intelligent system having maximized biofunctionality and thermophysiological comfort.

Paper group:

Objectives & Achievements

- The composition of essential oils from several shrubs was studied and their corresponding biochemical performance evaluated. Other studies have focused on the extraction, purification and structural characterization of phenolic compounds from *Prunus avium*.
- Synthesis of ferrocene and carbohydrate derivatives.
- Paper modelling, with emphasis on the effect of morphological fibre properties and some paper formation parameters.
- In the printing field, a home-made advanced optical experimental setup allowed us to follow the ink drop dimension, their surface spreading and its final imbibition into the paper. This methodology contributes to understand the complex phenomena of the dynamic paper/ink interactions.
- Enhancement of cork and olive mill wastewaters biodegradability, using ozone pretreatment. The effect of the initial chemical oxygen demand on the olive mill wastewater biodegradability was also established.
- .The competitive kinetics of decolourisation of mixture of two dyes was studied and synergic effects were observed.

Fundamental Sciences group

The following studies were performed with success:

- Anodic oxidation of xenobiotic pollutants on BDD and Ti/Sn-Sb electrodes.
- Photodegradation of dyes with TiO₂ impregnated textile fabrics
- Anaerobic biodegradation of spent brewery grains and aromatic compounds.
- Extraction of 8,15-Epoxyabdone and norabdone diterpenoids from *Eragrostis viscosa*.
- Start-up times in viscoelastic channel and pipe flows.
- Comparison of different formulations for the numerical calculation of unsteady incompressible viscoelastic fluid flow.
- Viscoelastic flows in mixing-separating cells

Activities

Integrative/multidisciplinary activities during the year of 2011

The Unit researchers are originated from various Departments of UBI, namely: Textile Engineering; Chemistry; Physics; Mathematics; and Electromechanical Engineering. Interdisciplinary activities are therefore guaranteed, with each researcher bringing his/her particular knowledge/experience to the integration of a "final product" consisting of a Textile or Paper material. That integration and focus is mainly controlled by the Unit leader (who is originated from the Textile Engineering Department) and the PIs from the Textile, Paper and Chemistry Groups. The Unit is thus unique in the sense of integrating the Applied Research perspective and the large experimental facilities typical of the Textile and Paper industries, with the Fundamental Sciences point of view of Chemistry, Physics and Engineering.

Outreach activities during the year of 2011

The Unit collaborates with a number of services surrounding the University through "extension" or "outreach" activities, encompassing:

Activities

- Support to Post-Graduation studies;
- Support to the industrial reorganization;
- Protocols with several enterprises and national and international Institutions.

These activities are also linked with the interest of Portuguese industry and society.

Particular Protocols for Post-Graduation Studies with the local community, in the Textile and Paper areas, have been promoted.

Conventions, Protocols and Co-operation Agreements:

- Université de Haute Alsace, France (École Nationale Supérieure des Industries Textiles de Mulhouse)
- Université de Grenoble - INPG
- Universitat Politècnica de Catalunya, Spain (Escuela Técnica Superior de Ingenieros Industriales de Terrassa)
- Universidade de Aveiro
- Universidade de Coimbra
- Universidade de Lisboa
- Universidade Técnica de Lisboa
- Universidade do Porto
- Universidade do Minho
- Universidade Nova de Lisboa
- Universidade de Évora
- Consejo Superior de Investigaciones Científicas, Barcelona, Spain (Instituto de Tecnología Química y Textil)
- Centro de Cooperação dos Industriais de Máquinas e Ferramentas
- Força Aérea Portuguesa
- Superintendência dos Serviços do Material da Armada
- Woolmark Company
- Direcção-Geral da Indústria (DGI)
- Centro Tecnológico das Indústrias Têxteis e do Vestuário (CITEVE)
- Laboratório Nacional de Energia e Geologia (LNEG)
- Centro de Formação Profissional da Indústria Têxtil (MODATEX)
- Associação Nacional das Indústrias de Vestuário e Confecção (ANIVC/APIV)
- Associação Nacional dos Industriais de Lanifícios (ANIL)
- Associação Têxtil e Vestuário de Portugal (ATP)

Activities

- A Penteadora – Sociedade Industrial de Penteação e Fiação de Lãs, S.A.
- Associação Portuguesa dos Técnicos das Indústrias de Celulose e Papel (TECNICELPA)
- Grupo ALTRI SGPS
- Grupo Portucel-Soporcel

Funding

	2008	2009	2010	2011
LA FCT	0,00	0,00		
Units FCT	114.468,00	139.776,00	136.500,00	115.555,00
Projects FCT	41.716,00	64.428,00	206.656,41	143.325,96
Other (National)	127.670,00	282.090,19	152.834,11	670.102,19
Other (International)	0,00	0,00	0,00	0,00
National Industry	0,00	6.750,00	0,00	0,00
International Industry	0,00	0,00	0,00	0,00
	283.854,00	493.044,19	495.990,52	928.983,15

General Indicators

	2007	2008	2009	2010	2011	Total
No. of Researchers Hired (Ciência Programme)	0,00	0,00	0,00	0,00	3,00	3,00
No. of Researchers integrated with PhD	0,00	0,00	0,00	0,00	37,00	
Training PhDs (PhD thesis completed)	0,00	0,00	0,00	0,00	1,00	1,00

Researchers Hired

Name	Start Date	End Date	Other Institution
Carla Sofia Cardona Jorge Gaiolas	22-02-2008	21-02-2013	
Isabel Maria Gonçalves Trindade	01-07-2009	30-06-2014	
Susana Sofia Ramos	01-07-2009	30-06-2014	

Technical Personnel Hired

Name	Start Date	End Date	Other Institution
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No technical personnel found...

Additional Comments**Research Groups**

Reference	Title / Principal Investigator
RG-Centro-195-1518	<u>Textile Materials</u> (José Mendes Lucas)
RG-Centro-195-1682	<u>Paper Group</u> (Rogerio Manuel dos Santos Simoes)
RG-Centro-195-2348	<u>Fundamental Sciences</u> (Ana Maria Carreira Lopes)

Strategic Project Adjustments

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Group Description

Title of Research Group:	(RG-Centro-195-1518) Textile Materials
Principal Investigator:	José Mendes Lucas
Main Scientific Domain:	Ciências e Engenharia de Materiais
Group Host Institution:	Universidade da Beira Interior

Funding, source, dates

Funding, source, dates

- QREN/POFC-SI I&DT-Co-promotion

. MEDTEX - Revestimentos têxteis inteligentes para acamados e pessoas com mobilidade reduzida, 01/06/2009-31/05/2012 (total funding: 209.228,62€)

Funding 2011: 46.606,24€

- QREN/POFC-SI I&DT-Mobilizer

. PT 21 - Powered Textiles Século 21, 03/01/2011-31/12/2013 (total funding: 322.191,14€)

Funding 2011: 28.977,86€

- FP7-PEOPLE - Marie Curie Actions - Industry-Academia Pathways and Partnerships

. INSYSM-Intelligent Systems for Structures Strengthening and Monitoring (Grant Agreement No 251373), 01/09/2010-31/08/2014 (total funding: 64.907,00€)

Funding 2011: 25.154,62 €

- QREN/PORC-maisCentro

. Funcionalização bioactiva e antimicrobiana de materiais de base têxtil para aplicações na área da saúde, 01/01/2011-31/12/2012 (total funding: 266.990,00€)

Funding 2011: 13.095,22€

- Composites de altas prestaciones de nanopartículas cerâmicas en fibras de poliéster: Propiedades y aplicaciones, 01/01/2011-31/12/2013 (total funding: 40.000,00€)

- FCT Projects:

Funding, source, dates

. PTDC/EBB-BIO/113671/2009 - Skin2Tex-Péptidos bioactivos com novas aplicações: Uma nova estratégia na concepção de têxteis antimicrobianos não-tóxicos para a área da saúde, 24/12/2010-23/12/2012 (total funding: 107.793,00€)

Funding 2011: 39.290,11€

Objectives & Achievements**Objectives**

A research line on nanotechnology, specifically concerning to the development of a nanofibre production prototype will be carried out.

Biotechnology and nanotechnology as effective tools for the development of new bioactive and antimicrobial textiles for health and cosmetic applications.

Skin2Tex_Old peptides with new faces: A new strategy to develop non-toxic antimicrobial textiles for healthcare applications.

Development of wearable textiles prototypes will combine research in functional textile materials incorporating sensorial and communication capabilities using proximity electronics and the respective collector for data storage or wireless transmission, aiming comparison of acquired signals to electromyography and ECG commercial devices.

Development of concepts and prototypes of Smart Fashion Accessories, with approach in function, aesthetics and some cultural influences (new technologies - smart phones and tablets).

Development of new fashion complements or transformation of existing ones, improving multifunctionality by using design concepts, 2D and 3D garment modelling and garment making techniques closed to sustainability. Development new products for young consumers with fit and health problems.

Development new processes and products for the sustainability, with zero-waste philosophy, using cellulosic fibres, in partnership with Paper Group, and traditional fabrics of Beira Interior region.

Research on woollen fabrics having added functionalities coming from the blend of wool and PLA fibres, with specific and complementary properties according to the end use. Investigate at manufacturing process and product engineering levels, to evaluate fabric performance of garments and the development garment collections for a market approach.

Research on textile and clothing mass customisation: Methodologies of simulation and training. Design and product development. Co-design producer/consumer. Demands and functionalities of new products, communication strategies and benchmarking methodologies. Morphology and anthropometry of human body. Objective testing and quality control equipment through simulation. Guidelines to the development of an e-commerce platform for customized garments. E-learning project for the long life training clothing industry staff members.

MEDTEX- Intelligent textile coatings for bedridden and persons with reduced mobility. These intelligent textiles will be developed in order to potentiate its application in different areas. The main objective it to develop biomedical textiles – an electro textile intelligent system having maximized biofunctionality and thermophysiological comfort.

Objectives & Achievements

Main Achievements

Development of new antimicrobial processes for textiles using nanobiotechnological approaches, especially with natural biocide agents.

Laboratorial testing, characterization and properties improvement of wool and polylactic acid based fabrics.

Under the project Clothe4Health, development and testing of two prototype T-shirt Sensorized to purchase signs of heart beat with three textile electrodes located inside the t-shirt for contact with the skin on the chest, and electrically connected by interconnections textiles to a portable module BioPlux (Plux Company), processing and transmission of real-time signal, wireless, digital, for a PC. Implementation and test of a three band integrating textile electrodes for the same purpose of the prototypes of T-shirts. To develop and test a prototype consisting of a sleeve rash guard, including two textile electrodes for monitoring the movement of upper limbs by monitoring in real time with BioPlux, arm muscle activity by surface electromyography.

Under the project "Textile and Clothing Mass Customisation" and in the context of Master Thesis, were studied same cases of design and product development, namely the best fit and drape of a jacket with simple and double fabrics.

Development new function and new products of fashion accessories with smart fashion concept.

Development and test new products for young consumers with fit and health problems.

Development and test new product or re-use and transform process of materials.

Continued work on the project FCT PTDC/CTM/66558/2006, "Network deformation sensors for electro-textiles and healthcare," acting as Project Coordinator. Addition of UBI as an institution participating in the project.

Development of new bioactive and antimicrobial textiles for health and cosmetic applications. Development of non-toxic antimicrobial textiles for healthcare applications

Continuing work on textile coatings for bedridden and persons with reduced mobility.

Development of smart textiles: characterization of electromagnetic properties of textiles.

Group Productivity

Publications in peer review Journals

Manich A. M.; Carilla J.; Miguel R.A.L.; et al., Differential Scanning Calorimetry and Elasticity of Textured, Heat Set and Mechanical Strained Polylactide Multifilaments, *Fibres & Textiles in Eastern Europe*, Volume: 19, Issue: 6, Pages: 22-27, Published: November-December 2011.

Manich Albert M.; Miguel Rui; Lucas José; et al., Texturing, stretching and relaxation behaviour of polylactide multifilament yarns, *Textile Research Journal*, Volume: 81, Issue: 17, Pages: 1788-1795, DOI: 10.1177/0040517511411972, Published: October 2011.

Mendes Antonio de Oliveira; Fiadeiro Paulo Torrão; Lopes Miguel Rui Alberto, Virtual subjective pilling evaluation: an alternative, *Textile Research Journal*, Volume: 81, Issue: 9, Pages: 892-901, DOI: 10.1177/0040517510397573, Published: June 2011.

Group Productivity

P. Alpuim, V. Correia, E.S. Marins, J.G. Rocha, I.G. Trindade, S. Lanceros-Mendez, " Piezoresistive silicon thin film sensor array for biomedical applications", *Thin Solid Films*, 519 (2011) pp. 4574–4577.

Gouveia I.C., Antunes, L.C., Gomes A. P., Improving surface energy and hydrophilization of Poly (ethylene terephthalate) by Enzymatic and Low-Pressure Plasma Treatments; *Journal of the Textile Institute*, 2010, vol 102, 1–11, iFirst Article. 2011

M. J. Galdes, S. Daniel, N. Belino, P. Rocha, D. Esteves,- "The bioactive textile materials design as an emerging area in textile engineering research", published in *Technology and Medical Sciences*, 2011 Taylor & Francis Group, London, ISBN 978-0 415-66822-4.

M. J. Galdes, L. Hes, M. D. Araújo et al.,- "Optimization of dry and wet heat transfer trough textile structures", *Journal of Defect and Diffusion Forum Vols 312-315*, published by Scitec Publications Ltd, Brandrain 6, CH- 8707 Uetikon Zurique, Switzerland, 2011.

P. A. F. Rodrigues, S. I. V. Sousa, M.J. Galdes, M. C. M. Alvim, F. G. Martins,- " Bioactive nano-filters to control Legionella on indoor air", published in *Advanced Materials Research*, by Trans Tech Publications Ltd, Switzerland, 2011.

Isabel C. Gouveia et al "Functionalization of wool with L-cysteine: Process characterization and assessment of antimicrobial activity and cytotoxicity" *J. applied polymer science*, 2011

Isabel C. Gouveia "Synthesis and characterization of a microsphere-based coating for textiles with potential as an in situ bioactive delivery system" *Polym. Adv. Technol.*, 23 350–356, 2011

M. Santos Silva, R.A.L. Miguel, J. Lucas, M. Pereira and I. Trindade, What future for the textiles in Portugal?, ICEUBI 2011 – International Conference on Engineering – Innovation & Development, University of Beira Interior, November 28-30, 2011, Covilhã, Portugal.

A.M. Manich, B. Baena, D. Lopez-Santana, M. Martí, J. Carilla, R.A.L. Miguel, J. Lucas, M.J. Santos Silva and D. Cayuela, Influencia del termofijado en las propiedades mecánicas de filamentos texturados de polilactida, ICEUBI 2011 – International Conference on Engineering – Innovation & Development, University of Beira Interior, November 28-30, 2011, Covilhã, Portugal.

M. Santos Silva, R.A.L. Miguel, J. Lucas, M. Pereira and I. Trindade, "What future for the textiles in Portugal?", ICEUBI 2011 – International Conference on Engineering – Innovation & Development, University of Beira Interior, ISBN 978-989-654-079-1, November 28-30, 2011, Covilhã, Portugal.

P. A. F. Rodrigues, S. I. V. Sousa, M.J. Galdes, M. C. M. Alvim, F. G. Martins,- " Bioactive nano-filters to control Legionella on indoor air",Chiang Mai International Conference on Biomaterials & Applications, Agost 2011, Tailândia.

Other international publications

M. Santos Silva, Coordenador, Actas do Simpósio 2010 – Materiais e Processos Inovadores, UBI, ISBN 978-989-654-074-6, Depósito legal 330730/11, 550 exemp. 124 pág, UBI, Covilhã, 2011

Medtex project – Development of an electrotexile prophylactic tool ..., Belino, N.J.R. ; Galdes, M.J.O. ; Figueiredo, M.N. ; Ferreira, P.A.R.C. ; Pimenta, N. ; Cardoso, F. ; Matos, J. L., *Annals of the Univ of Oradea. ISSN 1843 – 813X, Vol. XII – Issue II, Pag. 28-32, Editura Universităţii din Oradea, Romania – 2011*

Rui Miguel, Sónia Melo, Madalena Pereira, José Lucas and M. Santos Silva, The Influence of Fabrics in the Fashion Clothing Design ..., 6th CIPED – Intern. Congress in Design Research, October 10-12, 2011, Lisbon, Portugal

I.G. Trindade, R. Salvado, J. Lucas, R. Miguel and M. Santos Silva, Textile Sensors for Smart Clothing: Design and Characterization Studies, 11th AUTEX 2011, 8-10 June 2011, Mulhouse, France

Group Productivity

I. Campos, J. Lucas, H. Gil, I. Trindade and M. Santos Silva, Development of Textile Substrates with Magnetic Properties, 11th AUTEX 2011, 8-10 June 2011, Mulhouse, France

M. Pereira, P. Martins, R. Miguel, J. Lucas and C. Duarte, The Attributes of E-Commerce in Fashion Design Products..., 11th AUTEX 2011, 8-10 June 2011, Mulhouse, France

Nuno M. Garcia, Pedro Tavares, Rui Miguel, Isabel Trindade, José Lucas, Madalena Pereira, Resilient Heart-Beat Detection Algorithm for ..., 11th AUTEX 2011, 8-10 June 2011, Mulhouse, France

R. Miguel, P. Rebelo, J. Rodrigues, J. Lucas and A. Manich, Simulation of Fabric Weave Shrinkage based on Structural Geometric Models, 11th AUTEX 2011, 8-10 June 2011, Mulhouse, France

Rui Miguel, I. G. Trindade, Madalena Pereira, Madalena Barata, F. Moreira da Silva, A Comunicação Associada à Moda Tecnológica, CECL – UNL, Colóquio Intern. Moda e Comunicação, MUDE, Mars 31 – April 02, 2011, Lisbon, Portugal

Andreia Santos, Rui Miguel, Análise do comportamento do consumidor e do design de moda de luxo, Designa 2011 Intern. Design Conference, Univ of Beira Interior, Nov 25-26, 2011, Covilhã, Portugal

Isabel G. Trindade, Madalena Pereira, M. Santos Silva, José Lucas and Rui Miguel, Vestuário Inteligente como uma Extensão Estética..., Designa 2011 Intern. Design Conference, Univ of Beira Interior, Nov 25-26, 2011, Covilhã, Portugal

J. M. R. Curto, A. H.Hekmati, J. Y. Drean, E. L.T. Conceição, A. T. G. Portugal, R.M.S.Simões and M.Santos Silva, "Three dimensional Polyamide-6 nanowebs modelling and simulation", 11th AUTEX 2011, Vol. 2, 8-10 June 2011, pp 630-643, Mulhouse, France

Santos Silva, M., Lucas, J., Pereira, M., Salvado, R., Trindade, I., "An Analysis of the Recent Developments in the Textile and Clothing Supply Chain", 11th AUTEX 2011, Vol. 2, 8-10 June 2011, pp 693-698, Mulhouse, France

Ana P. Gomes, João F. Mano, João A. Queiroz e Isabel C. Gouveia, DEPOSIÇÃO POR LAYER-BY-LAYER DE COMPOSTOS ANTIMICROBIANOS ... 6º Cong Luso-Moçambicano de Engenharia, Cap XXXII: Biotecnologia e Bioeng 977, Ref: 324601R. 2011

A. J. Padez; Daniela P. Sá; Isabel C. Gouveia; Duarte N.P. Vieira FUNCIONALIZAÇÃO BIOACTIVA DE MATERIAIS TÊXTEIS ..., 6º Cong Luso-Moçambicano de Engenharia, Cap XXXII: Biotecnologia e Bioengenharia 981, Ref: 324606R

Paulo Martins, Madalena Pereira, Susana Azevedo, Rui Miguel, Valor percebido pelo consumidor ..., DESIGNA 2011, Intern. Design Conference: A Esperança Projetual, 25 e 26 Novembro, 2011, UBI, Covilhã, Portugal

N.J. Belino, M. J. Geraldés, M. N. Figueiredo, P. A. Ferreira, N. Pimenta, F. Cardoso, J. L. Matos, Development of an electrotextile prophylactic ..., Maio 2011, Roménia

C. Pinheiro, M. J. Geraldés, J.I.R. Gomes,- Design funcional de vestuário para bebés ..., Intern. Conf on Engineering UBI2011 – Innovation and Development, Novembro 2011, Portugal

Nascimento, N., Salvado, R. e Borges, F., "Design de um boné com detector electrónico ...", DESIGNA 2011 Intern. Design Conf, 25-26 nov 2011, Covilhã, Portugal

Rita SALVADO, Mauro CORDEIRO, Jacques SILVY, Luís M.M. PINTO e Rui A.L. MIGUEL; "SELECTING NONWOVENS FOR FASHION DESIGN: Exercises Based on the Visual Observation", CIPED – VI Intern. Cong on Design Research, 10-12 Oct 2011, Lisboa, Portugal

Medtex project – An innovative electrotextile device for the prophylaxis of pressure ulcers, Belino, Nuno et Al, 1ST Smartex-Egypt 2011, May, 23Th – 25th 2011, Kafrelsheikh Univ, Egypt

Group Productivity

Medtex Project – A textile based e-health system for ..., Belino, N.J.R., Geraldes, M.J.O. 1, Figueiredo, M.N. , Ferreira, P.A.R.C., Pimenta, N. , Cardoso, F. Matos, J. L. Mendes, C.M.F. , ERA -6 - THE SYNENERGY FORUM The Conf for Intern. Synergy in Energy, Environment, 19-24 Sep, 2011, Greece

Medtex Project – development of an electrotexile prophylactic tool to prevent pressure ulcers, Belino, N.J.R., Geraldes, M.J.O. , Figueiredo, M.N. , Ferreira, P.A.R.C., Pimenta, N., Cardoso, F. Matos, J. L.; May 27-29, 2011, Oradea - Romania

Desenvolvimento de uma Estrutura Têxtil Funcional ..., Carrieri, M.Z, Belino, N.J.R. e Geraldes, M.J.O., Cong Luso-Moçambicano de Eng, Maputo, 29 de Ago. – 2 Set. 2011

Characterization of Nonwoven Needled Felts by Image Analysis Techniques, N. J. R. Belino; M. F. Nunes; P. T. Fiadeiro; M.J.O. Geraldes, 11th US National Cong on Computational Mechanics, Minneapolis, MN on July 25-29, 2011

Development of an Electrotexile Biodevice for Sleep Movements ..., Tavares, M. M. Belino, N.J.R., Patto, M. A. V. and Geraldes, M.J.O. – 6º Cong Luso-Moçambicano de Eng, Maputo, 29 de Ago. – 2 Set. 2011

Development of Bioelectromagnetic Wound Dressings ..., Farropas, S.M.S.; Belino, N.J.R.; Cabrita, C.M.P.; Geraldes, M.J.O., Cong 6º Luso-Moçambicano de Eng, Maputo, 29 de Ago. – 2 Set. 2011

Nano-filtro Bioactivo para o combate da Legionella ..., Rodrigues, P.A.F., Geraldes, M.J.O., Rocha, P.M.M., Ferraz, C.A., Gomes, J.S.; 6º Cong Luso-Moçambicano de Eng, 29 de Ago a 2 de Set de 2011

Wound Dressing for Exudates ..., ALVES, J.L., BELINO, N.J.R., FIGUEIREDO, A.C and GERALDES, M.J.O.; 6º Cong Luso-Moçambicano de Eng, Maputo, 29 de Ago – 2 Set

Other national publications

Cristina Almeida, Helena Alves, Rui Miguel, Chapter “A Imagem das Marcas Portuguesas de Vestuário”, Book “A Moda num Mundo Global / Fashion in a Global World”, Coordination Isabel Cantista, Francisco Vitório Martins, Paula Rodrigues e Maria Helena Villas Boas Alvim, Editor Vida Económica – Editorial, SA, ISBN 978-972-788-414-8, May 2011.

“Development of an electroactive textile system for the objective assessment of sleep movements and neurodegenerative diseases”; Tavares, Michella Melo; Belino, Nuno José Ramos; Patto, Maria Assunção Vaz; Geraldes, Maria Jose O.; 23 de Setembro de 2011; E-ISBN: 978-1-4577-0521-2; Print ISBN: 978-1-4577-0522-9; Lisboa, Portugal.

“Bioelectromagnetic wound dressings as tool for the prophylaxis of pressure ulcers”; Farropas, S.M.S; Belino, N.J.R.; Cabrita, C.M.P.; Geraldes, M. Jo; 23 de Setembro de 2011; E-ISBN: 978-1-4577-0521-2; Print ISBN: 978-1-4577-0522-9; Lisboa, Portugal.

“Nano-bioabsorbent composite wound dressing for exudate management”; Alves, Janete Lara; Belino, Nuno Jose; Geraldes, Maria Jose; 23 de Setembro de 2011; E-ISBN: 978-1-4577-0521-2; Print ISBN: 978-1-4577-0522-9; Lisboa, Portugal.

“Legionella: Bioactive nano-filters for air purification systems”; Rodrigues, Patricia Alexandra Franco; Geraldes, Maria Jose; Belino, Nuno Jose; 23 de Setembro de 2011; E-ISBN: 978-1-4577-0521-2; Print ISBN: 978-1-4577-0522-9; Lisboa, Portugal.

Isabel G. Trindade, Madalena Pereira, Rui Miguel and M. Santos Silva, A Perspective on key factors for successful transfer of technology, Symposium UMTP 2011 – Transferência de Conhecimento e Tecnologia, Textile and Paper Materials R&D Unit, University of Beira Interior, December 15-16, 2011, Covilhã, Portugal.

Group Productivity

I. G. Trindade, C. Gaiolas, J. Lucas, R. Miguel and M. Santos Silva, Synthesis and characterization of electrically conductive textile/PEDOT samples, Symposium UMTP 2011 – Transferência de Conhecimento e Tecnologia, Textile and Paper Materials R&D Unit, University of Beira Interior, December 15-16, 2011, Covilhã, Portugal.

I. G. Trindade, M. Pereira, R. Salvado, J. Lucas, N. Garcia, M. J. Santos Silva and R. Miguel, "Intelligent Clothing for Health Care", apresentação oral no Simpósio Materiais e Processos Inovadores, Dezembro 2010, publicado no livro de actas do simpósio, ISBN:978-989-654-074-6 (2011) pp. 50-53.

N. Monteiro, R. Miguel, Modelização da resistência à abrasão de tecidos de lã e poliéster em função das características estruturais de fios convencionais, Symposium UMTP 2011 – Transferência de Conhecimento e Tecnologia, Textile and Paper Materials R&D Unit, University of Beira Interior, December 15-16, 2011, Covilhã, Portugal.

P. A. F. Rodrigues, M.J. Gerales, N. Belino, - "Legionella: bioactive nano-filters for air purification systems", 1st Portuguese Meeting in Bioengineering, Março 2011, Portugal.

M. J. Gerales, L. Hes, M. D. Araújo et al.,- "Optimization of dry and wet heat transfer trough textile structures", 7 International Conference On Diffusion in Solids and Liquids DSL-2011, Junho 2011, Portugal.

M. J. Gerales, M. Goreti, -"Recycling PET materials in a way to get sustainability in the textile industry", Wastes 2011, Setembro 2011, Portugal.

C. Pinheiro, M. J. Gerales, J.I.R. Gomes,- "Design funcional de vestuário para bebés com propriedades de repelência ao insecto da malária", VI Congresso Internacional de Pesquisa em Design, Outubro 2011, Portugal.

M. J. Gerales, L. Hes, M. D. Araújo, -"Simulation and modelling the thermal behaviour of textile structures", III ECCOMAS Thematic Conference – VIPIMAGE 2011. Outubro 2011, Portugal.

C. Pinheiro, M. J. Gerales, J.I.R. Gomes,- "A intervenção do design em causas humanitárias- como o controlo da malária", Simpósio 2011- Transferência de Conhecimento e Tecnologia, UMTP, Dezembro 2011, Portugal.

N. Nascimento, R. Salvado, F. Borges e P. Araújo; "Desenvolvimento de um boné para apoio à mobilidade de deficientes visuais"; Simpósio 2011 – Transferência de Conhecimento e Tecnologia, 15-16 dezembro 2011, Covilhã, Portugal.

"Development of an Electroactive Textil System ...", Michella Melo Tavares, Nuno José Ramos Belino, Maria Assunção Vaz Patto, Maria José O. Gerales, 1º Encontro Nacional de Bioengenharia, Tagus Park, Campus do IST – Oeiras, 1 a 4 de Março 2011

Bioelectromagnetic Wound Dressings ...", Farropas, S.M.S.; Belino, N.J.R.; Cabrita, C.M.P.; Gerales, M.J.O, 1º Encontro Nacional de Bioengenharia, Tagus Park, Campus do IST – Oeiras, 1 a 4 de Março 2011

Nano-Bioabsorbent Composite ...", ALVES, Janete Lara; BELINO, Nuno José; GERALDES, Maria José;" 1º Encontro Nacional de Bioengenharia, Tagus Park, Campus do IST – Oeiras, 1 a 4 de Março 2011

Legionella: Bioactive nano-filters for air purification systems", Rodrigues, P.A.F.; Gerales, M.J.O; Belino, N.J.R.; 1º Encontro Nacional de Bioengenharia, Tagus Park, Campus do IST – Oeiras, 1 a 4 de Março 2011

P. A. F. Rodrigues, M.J. Gerales, N. Belino, - "Legionella: bioactive nano-filters for air purification systems", 1st Portuguese Meeting in Bioengineering, Março 2011, Portugal.

M. J. Gerales, L. Hes, M. D. Araújo et al.,- "Optimization of dry and wet heat ...", 7 International Conference On Diffusion in Solids and Liquids DSL-2011, Junho 2011, Portugal.

Patents/propotypes

Group Productivity

Isabel Trindade, Madalena Pereira, José Lucas, Nuno Garcia, Rui Miguel, Manuel Santos Silva, "Evolução e teste de um protótipo de T-shirt sensorizada para aquisição de sinais de batimento cardíaco com sete eléctrodos têxteis localizados no interior da t-shirt para contacto com a pele, sobre a região frontal do tronco, e electricamente ligados por interligações têxteis a um módulo portátil BioPlux (empresa Plux), de processamento e transmissão de sinal em tempo real, sem fios, em formato digital, para um PC". O protótipo da t-shirt foi exposto no Modtíssimo – Têxteis do Futuro, Unidade de I&D Materiais Têxteis e Papeleiros, Universidade da Beira Interior, Fevereiro de 2011.

Sónia Melo, Rui Miguel, Madalena Pereira, "Projecto, produção e teste de dois protótipos de casaco curto feminino, um construído com tecido simples e o outro com tecido duplo, para avaliação da influência do tipo de tecido no cair da peça de vestuário", Unidade de I&D Materiais Têxteis e Papeleiros, Universidade da Beira Interior, Janeiro 2011.

Luísa Rita Salvado et al. Registo de obra "Le(a)d Us Up – Jogo das Cadeiras", Registo nº 6243/2011, IGAC.

- Isabel C. Gouveia e Daniela Sá, Patente PT 104540 (A) PROCESSO ANTIBACTERIANO PARA FUNCIONALIZAÇÃO BIOACTIVA DE MATERIAIS TÊXTEIS BIOMÉDICOS, GERIÁTRICOS E PEDIÁTRICOS, À BASE DE LÃ. (concedida 22-06-201).

- registo provisório - Isabel C. Gouveia - pedido de patente PT 104823 "MÉTODO DE FUNCIONALIZAÇÃO BIOACTIVA DE MATERIAIS TÊXTEIS ATRAVÉS DA PRODUÇÃO E FIXAÇÃO SONOQUÍMICA DE MICROESFERAS PROTEICAS".

Organization of conferences

M. J. Geraldes, Organization of the conference " New evaluation methods of moisture transfer phenomenon", by Prof. Lubos Hes from the Technical University of Liberec, October 2011.

M. J. Santos Silva, R. A. L. Miguel, J. M. Lucas, I. C. Gouveia- Members of the Scientific Committee of the "Simpósio 2011 – Materiais e Processos Inovadores, Unidade Materiais Têxteis e Papeleiros", University of Beira Interior, Covilhã, 15-16 December 2011.

M. J. Santos Silva, J. M. Lucas, I. Trindade - Member of the Organizing Committee of the "Simpósio 2011 – Materiais e Processos Inovadores, Unidade Materiais Têxteis e Papeleiros", University of Beira Interior, Covilhã, 15-16 December 2011.

Internationalization

M. J. Santos Silva, Member of Scientific Board of International Textile Conference AUTEX 2011, Mulhouse, France.

M. J. Santos Silva, Scientific Reviewer of Textile Research Journal.

M. J. Santos Silva, Comissão Científica, International Conference on Engineering – Innovation & Development, University of Beira Interior, November 28 -30, 2011, Covilhã, Portugal.

Strategic Project Adjustments

Strategic Project Adjustments

FCT Relatório Científico 2011 Print: 27-03-2012 19:38:45 [Materiais Têxteis e Papeleiros]

Group Description

Title of Research Group:	(RG-Centro-195-1682) Paper Group
Principal Investigator:	Rogério Manuel dos Santos Simoes
Main Scientific Domain:	Ciências e Engenharia de Materiais
Group Host Institution:	Universidade da Beira Interior

Funding, source, dates

Funding, source, dates

- QREN/POFC-SI I&DT-Co-promotion

. PADIS 5348-Papéis de alto desempenho à impressão, 01/10/2009-31/08/2011 (total funding: 170.405,12€)

Funding 2011: 105.906,12€

- QREN/PORC-maisCentro

. Caracterização, valorização e tratamento integrado de efluentes agro-industriais, 01/12/2010-30/11/2012 (total funding: 278.063,46€)

Funding 2011: 185.841,89€

- FCT Projects:

. PTDC/AGR-AAM/102042/2008-Integrated treatment of cork processing wastewaters for potential reuse, 01/05/2010-30/04/2013 (total funding: 68.484,00€)

Funding 2011: 10.074,48€

. PTDC/QUI-QUI/102114/2008-Hidratos de carbono como unidade estrutural em Química Bioorganometálica. Uma abordagem sintética e estrutural, 01/04/2010-31/03/2013 (total funding: 24.432,00€)

Funding 2011: 7.281,40€

. PTDC/QUI-QUI/110532/2009-Hidratos de carbono como unidade estrutural quiral para a síntese assimétrica de moléculas biologicamente importantes, 01/04/2011-31/03/2014 (total funding: 24.480,00€)

Funding 2011: 329,95€

Objectives & Achievements

Objectives

Objectives & Achievements

The general objective of the paper research group is to carry out applied research on the pulp and paper field, and biorefinery as well. The group intends to progressively focus on the concept of biorefinery, and some topics are being investigated, namely: extraction of bioactive compounds from lignocellulosic materials, synthesis of derivatives, and optimisation of sugar liberation from lignocellulosic materials. The field of biocomposites is another area of our future attention. Regarding pulp and paper, the influence of raw materials on paper properties and the modelling of the three-dimensional structure of paper, and other fibrous materials are the main objectives. The effluent treatment continues to be object of our attention, focused on the kinetic of the processes.

Active compounds

The potential of several active compounds obtained from essential oils from several shrub and wood species was investigated. Crude extracts, fractions and pure compounds were screened for antimicrobial activity, potential antimutagenicity and genotoxicity and cytotoxicity. The potential of new natural sugar derivatives were also investigated.

Pulp delignification

A FCT project recently initiated aims to identify and evaluate the extractives in wood from *Eucalyptus globulus*, to study their variation with seasonality and, tree age, and to develop a prototype to test pretreatments for extractives removal, in order to decrease their negative influence in pulp and paper production.

3D Paper modelling

We intend to implement an innovative tree dimensional paper model, where fibre dimensions, fibre flexibility and fibre collapsibility are introduced, in order to develop a model which gives realistic predictions for many paper properties, particularly the structural ones. The model will be extended to other fibrous material.

Ink-jet printing

The objectives of this QREN project were the development of new uncoated papers for digital and offset printing processes, understanding/interpretation of the ink/paper and toner/paper interaction, interpretation and explanation of the relationship between surface characteristics and print quality.

Cork Effluent treatment

Portugal is the World's leading country for cork production and transformation. Close to 80% of the income resulted from cork oak exploitation depends on cork value, which is closely related with the acceptance of cork as natural premium raw material for stoppers. However, the wastewaters resulted from the boiling stage (about 400 l/ton of cork) are a dark liquor containing corkwood extracts, several of them are toxic or recalcitrant compounds. This FCT project is addressed to study an innovative depuration process integrating membrane technologies, ozonation and constructed wetlands.

Main Achievements

Active compounds

This research line comprises the essential oils and other extracts. Regarding to the essential oils, several shrub were studied and their oil composition and corresponding biochemical performance evaluated. Other study concerns with the extraction, purification and structural characterization of

Objectives & Achievements

phenolic compounds from *Prunus avium*. Using several techniques, including nuclear magnetic resonance spectroscopy of proton ($^1\text{H-NMR}$) and carbon ($^{13}\text{C-NMR}$), some phenolic compounds were identified. The antioxidant activity of the extracts from several part of the cherry tree, and the compound catechin isolated from the wood extract, was studied.

Ferrocene and carbohydrate derivatives

The commercial available acetylferrocene and ferrocenecarboxaldehyde were used as starting materials for this work. Carbon chain elongation methods, namely Wittig, Reformatsky and Grignard reactions, were used to create a spacer between the ferrocene and the specie to be linked. Corresponding sugar derivatives were synthesized, starting from commercial compounds (glucose, galactose, xylose) that were protected with protective groups. Different hydroxyl groups were functionalized to allow the reaction between the sugar derivative and ferrocene derivative. The linkage between ferrocene derivatives and other molecules was made using conventional methods (for example aldol and/or Michael reactions), but several organocatalysis was also tested.

Pulp refining

Pulp refining hydro-mechanical modelling: Theoretical improvements using our already established refining experimental results were made, based on the experimental and theoretical advances in fibre flocculation physics and dynamics. Our current works in the mechanical refining area pursue this line, focusing in the following points: (i) fibre suspension rheology and physics; ii) hydromechanical modelling of refining; iii) pulp and paper properties response to hydro-mechanical refining conditions and efficiency.

3D Paper modelling

The three-dimensional paper model was developed, based on a sedimentation model like the KCL-PAKKA model. An original extension of the deposition model delineated in the literature was developed. MATLAB and cellular automata framework were used to implement the model. The model presents several original contributions, such as allowing the study of fibre collapse influence as well as fibre flexibility. The particle deposition rule of Provatas and Uesaka (2003) has been used to simulate the effects of flocculation and hydrodynamic smoothing. Experimental work was carried out to validate the model, using the most important fibres used in office paper production. The model is being extended to nanofibrous networks.

Ink-jet printing

Surface sizing formulations, based on selected commercial chemicals, were applied on unsized industrial paper, and their performance evaluated using gamut area and optical printing density of colour and black. The ink absorption process was studied, using image analysis and the main achievements are as follow: (1) an home-made optical experimental setup was implemented, which enable to follow the drop dimension and their surface spreading; (2) the final imbibition of the ink into the paper was studied, observing under the microscope successive sections of the imbibition zone; (3) the relationships between the classical paper physicochemical properties, the dynamic interaction between the ink and paper and the corresponding printing quality was also investigated.

Cork Processing wastewater treatment

Industrial wastewater samples were collected at two cork mills and their preliminary characterisation was carried out. The experimental work regarding nanofiltration and ozonation was initiated. The effect of samples pH on the performance of ultrafiltration membranes and on the concentrates ozonation was studied aiming to increase biodegradability (using the BOD5/COD and BOD20/COD ratios as indicators) and reduce the toxicity (assessed by Microtox bioassays).

Objectives & Achievements

Other studies with ozone and textile dyes were also carried out aiming to evaluate the competitive kinetics of decolourisation of mixture of dyes. Synergic effects were observed when the dyes are mixed, and the ozone consumption by the dyes in competition is not so different, despite the markedly different reaction rate for the isolated dyes.

Group Productivity

Publications in peer review Journals

J.M.Rodilla, L.A. Silva, N. Martinez, D. Lorenzo, D. Davyt, L. Castillo, C. Giménez, R. Cabrera, A. González-Coloma, L. Zrostlíková, E. Dellacassa,. Advances in the identification and agrochemical importance of sesquiterpenoids from *Bulnesia sarmientoi* essential oil, *Industrial Crops and Products*, 33, 497–503 (2011).

A. González-Coloma, F. Delgado, J.M. Rodilla, L. Silva, J. Sanz, J. Burillo, Chemical and biological profiles of *Lavandula luisieri* essential oils from western Iberia Peninsula populations, *Biochemical Systematics and Ecology* 39, 1–8 (2011).

L. Silva, A.C. Gomes, J.M. Rodilla, Diterpene Lactones with Labdane, Halimane and Clerodane Frameworks, *Natural Product Communications* 6 (4), 497-504 (2011).

A. Gomes, F. Delgado, T. Tinoco, J. Rodilla, L. Silva, Antifungal activity and chemical composition of *Mentha cervina* L. essential oils, *Planta Medica. Journal of Medicinal Plant and Natural Products Research* 77 (12), 1295 (2011).

Francesca Fani, René Torres, Jesús M. Rodilla, Cecilia Labbé, Carla Delporte, Fabián Jaña, Chemistry and Bioactivity of *Haplopappus remyanus* ("bailahuen"), a Chilean Medicinal Plant, *J. Braz. Chem. Soc.*, Vol. 22, No. 12, 1-6, 2011.

J.M.R. Curto, E.L.T. Conceição, A.T.G. Portugal, R.M.S. Simões, Three dimensional modeling of fibrous materials and experimental validation, *Materialwissenschaft und Werkstofftechnik, Materials Science and Engineering Technology*, Wiley-vch, Germany, Wiley-Blackwell, USA, vol.42 no.5 (2011): pp. 370-374.

Álvaro Vaz, Rogério Simões, Jacques Silvy, Hydromechanical response of different pulp fibre suspensions, *Appita J.*, 64 (2), 175-184 (2011).

O.M.S. Anjos, A.J.A. Santos, R. M.S. Simões, Effect of *Acacia melanoxylon* wood density on papermaking potential, *Appita J.*, 64 (2), 185-191 (2011).

Other international publications

A. Gomes, C. Pinto, J. Araujo, J. Rodilla, L. Silva, Seasonal variability of essential oils of *Thymus Mastichina* L. from PNTI (Portugal), 42nd International Symposium of Essential Oils (ISEO 2011), September 2011, Antalya, Turkey.

A. F. Barrero, J. F. Quillez del Moral, L. Silva, C.L. Sanchez, A. Castillo, An efficient formal synthesis of (-)-siccanin, V Mediterranean Organic Chemistry Meeting June 2011, Cadiz, Spain.

J.M.R. Curto, E.L.T. Conceição, A.T.G. Portugal, R.M.S. Simões, The Influence of Eucalyptus and reinforcement fibers flexibility on paper properties: experimental and 3D paper model evaluation. In Proceedings of the 5th ICEP International Colloquium on Eucalyptus Pulp held in May 9-12, Porto Seguro, Brazil (2011).

Group Productivity

J.M.R. Curto, A.H. Hekmati, J.Y. Drean, E.L.T. Conceição, A.T.G. Portugal, R.M.S. Simões, M.J. Santos Silva, Three dimensional polyamide-6 nanowebs modeling and simulation, In Proceedings of the 11th World Textile Conference, AUTEX 2011 (Association of Universities for Textiles), Mulhouse, ENSISA (École Nationale Supérieure d'Ingénieurs Sud Alsace), France, June, vol.2 (2011): pp. 639-643. ISBN: 978-2-7466-2858-8.

J.M.R. Curto, E.L.T. Conceição, A.T.G. Portugal, R.M.S. Simões, The fiber properties influence on a three dimensional web model: reinforced office paper and cellulose nanowebs case studies. In Proceedings of the 5th International Conference on Advanced Computational Engineering and Experimenting, ACE-X2011, Algarve, Portugal (2011). Abstract. (Best Paper Young Scientist Award, Springer).

Álvaro Vaz, Andreia Fial, Rogério Simões, "Delignification kinetics of pulp pine by Lacase Mediator System", 6º Congresso Luso-Moçambicano de Engenharia, Maputo, 29 Ag.- 2 Set. 2011.

Rogério Simões, Jacques Silvy, Álvaro Vaz, "Refinação de pastas químicas: hidromecânica e evolução das propriedades do papel", Congresso Luso-Moçambicano de Engenharia, Maputo, 29 Ag.- 2 Set. 2011.

J. A. Figueiredo, M. Isabel Ismael, Synthesis of Precursors for the Formation of Heparine Derivatives, Glupor 9 – 9th International Meeting Of The Portuguese Carbohydrate Group/ V Iberian Carbohydrate Meeting, Universidade Trás-os-Montes e Alto Douro, Vila Real, Portugal, Setembro 2011.

J. A. Figueiredo, M. I. Ismael, Jorge Pinheiro, Rita Pereira, C. Anjo, Artur M. S. Silva, Jorge Justino, F. Vinagre, M. Goulart, R. Garcia, M. E. Araujo, Amélia P. Rauter, "Pseudo-C-Nucleosides linked to sugars as non-toxic antioxidants and acetylcholinesterase inhibitors", Glycosciences in the International Year of Chemistry. Applications to Human Health and Disease, Lisboa, Portugal, Setembro 2011.

Natércia Maria Ferreira Santos, Diana Olival, Carla Amaral, Cecília Baptista, Biosurfactants Produced by Yeasts - Potencial Use in Soil Bioremediation, Book of Abstracts Proc. CHEMPOR'2011, Lisboa, Setembro 2011, 96-97

Other national publications

E.L.T. Conceição, J.M.R. Curto, R.M.S. Simões, A.T.G. Portugal, Parallelization of a parameter estimation problem in a 3D model of paper. In Proceedings of the "Congresso de Métodos Numéricos de Engenharia", CMNE, APMATC, Coimbra, Portugal, 14-17 July, vol.1 (2011).

J. Araújo, F. Delgado, J. Rodilla, A. Gomes, L. Silva, "Total phenol content in solvents extracts of Lavandula luisieri", Simpósio 2011 Unidade de Materiais Têxteis e Papeleiros, Universidade da Beira Interior, Dezembro, Covilhã, 2011.

D. Santos, N. Canto, R. Páscoa, L. Silva, R. Simões, A. Gomes, "Phenolic compounds in cork processing wastewater" Simpósio 2011 Unidade de Materiais Têxteis e Papeleiros, Universidade da Beira Interior, Dezembro, Covilhã, 2011.

S. Pombal, J. Rodilla, L. Silva "Preparação de derivados de esqueleto guaieno a partir de guaiol e bulnesol" Simpósio 2011 Unidade de Materiais Têxteis e Papeleiros, Universidade da Beira Interior, Dezembro, Covilhã, 2011.

J.M.R. Curto, E.L.T. Conceição, A.T.G. Portugal, R.M.S. Simões, The Influence of Eucalyptus and reinforcement fibers flexibility on paper properties: experimental and 3D paper model evaluation. Info@tecnicepa.34, Publicação da Associação Portuguesa dos Técnicos das Indústrias de Celulose e Papel, pp. 97, Setembro, 2011.

Group Productivity

Rogério Simões, Jacques Silvy, Álvaro Vaz, "Refinação de pastas químicas: hidromecânica e evolução das propriedades do papel", info@tecnicelipa nº 35, Novembro de 2011.

J. Albertino Figueiredo, Carlos Anjo, M. Isabel Ismael, Ivânia Cabrita, Ana C. Fernandes, "Synthesis of ferrocene derivatives functionalized with α,β -unsaturated β -lactones", XXII Encontro Nacional da Sociedade Portuguesa de Química, Braga, Portugal, Julho 2011.

S. Santos, J.A. Figueiredo, M.I. Ismael, R. Simões, J. Rodilla, A.P. Duarte, "Antioxidant activity of phenolic compounds from *Prunus avium*", Seminário Indústria Têxtil E Papeleira: Transferência de Conhecimento e Tecnologia, Covilhã, Portugal, Dezembro 2011.

J. Albertino Figueiredo, Carlos Anjo, Rita Pereira, M. Isabel Ismael, Ivânia Cabrita, Ana C. Fernandes, "Synthesis of new α -methylene- β -Lactones Linked to Ferrocene Derivatives", Seminário Indústria Têxtil E Papeleira: Transferência de Conhecimento e Tecnologia, Covilhã, Portugal, Dezembro 2011.

J. L. Amaral³, A. P. M. Sousa³, N. J. Oliveira⁴, A. O. Mendes¹, S. C. L. Sousa¹, P. T. Fiadeiro^{1,2}, A. M. M. Ramos¹ Dinâmica da interacção tinta / papel na impressão inkjet, SIMPÓSIO 2011 da Unidade de Materiais Têxteis e Papeleiros

Organization of conferences

R. Simões, J.A. Figueiredo, A.M. Ramos- Members of the Scientific Committee of the "Simpósio 2011 – Materiais e Processos Inovadores, Unidade Materiais Têxteis e Papeleiros", University of Beira Interior, Covilhã, 15-16 December 2011.

R. Simões, A. Vaz, A.P. Costa - Member of the Organizing Committee of the "Simpósio 2011 – Materiais e Processos Inovadores, Unidade Materiais Têxteis e Papeleiros", University of Beira Interior, Covilhã, 15-16 December 2011.

M. I. Ismael - Member of Scientific Committee of Glupor IX- Encontro Internacional do Grupo dos Glúcidos da Sociedade Portuguesa da Química, Setembro, Universidade de Trás-os-Montes e Alto Douro, Vila Real, Setembro 2011.

Strategic Project Adjustments

FCT Relatório Científico 2011 Print: 27-03-2012 19:39:14 [Materiais Têxteis e Papeleiros]

Group Description

Title of Research Group:	(RG-Centro-195-2348) Fundamental Sciences
Principal Investigator:	Ana Maria Carreira Lopes
Main Scientific Domain:	Ciências e Engenharia de Materiais
Group Host Institution:	Universidade da Beira Interior

Funding, source, dates

Funding, source, dates

- QREN/PORC-maisCentro

. Valorização de sub-produtos de agro-indústria e co-remediação de compostos xenobióticos, 01/11/2010-31/10/2012 (total funding: 277.919,11€)

Funding 2011: 264.520,24€

- FCT Projects:

. PTDC/QUI/66507/2006 - Plantas medicinais angolanas: actividade biológica, 01/01/2008-30/04/2011 (total funding: 61.100,00€)

Funding 2011: 7.521,63€

. PTDC/CTM/64856/2006 - Desenvolvimento de novos materiais de eléctrodo baseados em filmes de nanocompósitos para aplicações ambientais, 01/11/2007-31/01/2011 (total funding: 36.950,00€)

Funding 2011: 6.034,97€

. PTDC/AAC-AMB/103112/2008 - Electrochemical degradation of leachates from sanitary landfills, 03/05/2010-02/05/2013 (total funding: 74.062,00€)

Funding 2011: 30.175,00€

. PTDC/QUI-QUI/100896/2008 - Affinity interactions between cyanine dyes and biomolecules in chromatographic processes, 02/05/2010-01/05/2013 (total funding: 164.984,00€)

Funding 2011: 24.836,05€

. PTDC/EME-MFE/098558/2008 - Compressible viscoelastic flows, 01/06/2010-31/05/2013 (total funding: 66.000,00€)

Funding 2011: 15.399,15€

. PTDC/EME-MFE/113988/2009 - IProExt, 01/03/2011-28/02/2014 (total funding: 7.200,00€)

Funding 2011: 0,00€

. PTDC/EME-MFE/114322/2009 - Extension, 01/03/2011-28/02/2014 (total funding: 51.384,00€)

Funding, source, dates

Funding 2011: 2.383,22€

Objectives & Achievements**Objectives**

The Fundamental Sciences Group team is composed by 13 members with a PhD degree, 1 Post-Doc, 6 PhD students and 3 students with a grant.

The main objectives of the Group are:

- Applied Research on Textile and Paper Materials, in a multidisciplinary way
- Research in Chemistry and Physics and Fluid Dynamics, related directly or indirectly with Textile and Paper Materials and Industries

Based on these objectives, the following keywords were defined for the research developed by the Group:

Textile Dyeing and Effluents Treatment

Nanomaterials

New Anode Materials

Chemical Characterization of Textiles and Plants

Functional dyes

Computational Rheology

Electrochemical degradation of pharmaceutical compounds

Electrochemical degradation of leachates from sanitary landfills

The work developed by the Group is realized in several different projects, listed bellow, with the respective objectives, in a succinct way.

Project "Cleaner Environment"

The purpose of the project is to reduce contaminants rejected by textile dyeing and finishing processes by applying a three-stage wastewater treatment process: bioreactors conjugated with membranes and polishing technologies (oxidation or adsorption).

This project also aims to use boron-doped diamond anodes, commercially available, as well as new nanomaterials, prepared in situ, to be used as anodes and photocatalysts in the degradation of dyes, aromatic amines, pharmaceutical compounds and leachates from sanitary landfills.

Project "Green Chemistry in Medicinal Plants from Angola"

This project uses traditional medicinal plants from Angola and its main objectives are:

- Chemical evaluation of the extracts already existing from different plants
- Spectroscopic characterisation of the isolated compounds
- Evaluation of biological activities against tropical diseases of the extracts and the isolated compounds

Objectives & Achievements

Project “New Stationary Supports for Affinity Chromatography”

The objective of this project consists on developing new stationary chromatography supports based on cellulose materials and monoliths, derivatized with cyanine dyes, able to interact selectively with proteins.

Project “Rheology and Computational Fluid Dynamics”

During manufacture and processing many materials used in the textile and paper industries exhibit non-Newtonian rheology, such as shear-thinning, normal stress effects, viscoelasticity, thixotropy, etc. There is the need to be able to predict and understand the deformation and flow of such materials.

In broad terms the aims of the this project are: Development of more robust and accurate numerical methods and techniques for the simulation of non-Newtonian flows; Acquire benchmark data to assess the numerical solutions; To enhance physical understanding of flow phenomena involving non-Newtonian materials.

Main Achievements

The work developed by the Fundamental Sciences Group is organized in several different projects. The main achievements of this group is described below, in a succinct way, for each of the different projects.

Project “Cleaner Environment”

The purposes of the project are to reduce contaminants rejected in the effluents of several industries, combining different technologies. It also aims to study physical-chemical properties of dyes, namely dissociation constants and solubility. The development of this project involves 4 different tasks.

Task 1: Aerobic and Anaerobic biodegradability of xenobiotics - Aerobic biodegradation of aromatic amines and dyes was performed with several inocula in batch tests. Anaerobic biodegradation of residual xenobiotics (dyes and levelling agents) was carried out in UASB reactors. Depending on type of carbon source and hydraulic retention time different decolourization rates were obtained.

Task 2: Electrochemical degradation of persistent pollutants - The electrochemical degradation of dyes, aromatic amines, pharmaceutical compounds and leachates from sanitary landfills was performed, using as anode materials boron-doped diamond (BDD), tin oxide, lead oxide, alone and doped with titanium oxide, and composite oxides of stannous and antimony. All products studied have shown very high degradation rates with good mineralization index. In some of the prepared anodes, improvements in their preparation was undertaken, in order to improve lifetime. Very good results were also obtained for the leachates treatment, either in the electrocoagulation with iron or aluminium anodes, or with anodic oxidation using BDD anodes.

Task 3: Photocatalytic oxidation and sorption of aromatic amines - The work developed was mainly on the preparation of TiO₂ anatase doped nanopowders and nanopowders-impregnated textiles. Work was also performed in aromatic amines photodegradation kinetic studies under visible and UV light.

Task 4: Acid dissociation constants and solubility of dyes - Acid-base properties of azo dyes were investigated. Ionization constants of methyl orange, acid orange 7 and acid orange 8 were determined both in water and in different ionic media (sodium chloride and sodium sulfate), in order to assess the influence of the salt concentration on the acid-base equilibria.

Project “Green Chemistry in Medicinal Plants from Angola”

Objectives & Achievements

This project involves 3 tasks: Preparation and chemical evaluation of the extracts; Spectroscopic characterisation of the isolated compounds; Evaluation of biological activities

The extracts were fractionated by column chromatography, flash chromatography, tin layer chromatography and HPLC. The compounds were identified by NMR techniques and characterised by IR, UV, ¹H NMR, ¹³C NMR, GC-MS and 2D-NMR. The biological activities against tropical diseases of the extracts and compounds isolated were evaluated.

Project “New Stationary Supports for Affinity Chromatography”

The project that comprises 3 tasks: Synthesis and characterization of new cyanines; Immobilization of cyanine dyes onto cellulosic supports and monoliths; Studies of affinity chromatography for standard proteins

The synthesis and fully characterization of reactive or functionalized cyanines was performed. The influence of different concentrations on the immobilization of cyanine dyes onto cellulosic supports and monoliths by optimised dyeing methods was studied. The cellulose derivatized was qualitatively and quantitatively characterised. The resulting dyed matrices were used as specific supports in affinity chromatography for standard proteins.

Project “Rheology and Computational Fluid Dynamics”

Research was carried out with the following purposes:

Elastic instabilities in flows through expansions and cross-slots – non-Newtonian viscoelastic models induce flow asymmetries in situations where the corresponding Newtonian flow is symmetric. Cross-slot devices, in particular, are employed in microfluidic applications, for example to uncoil and count DNA molecules.

Non-Newtonian flows in bifurcations – motivated by hemodynamical applications (genesis and location of atherosclerotic diseases). The size and intensity of vortices formed near bifurcating channels were quantified as a function of Reynolds and Deborah numbers.

Algorithms for computational rheology – robustness of present methods was enhanced by implementing the log-conformation formulation for the stress equations and different algorithms were tested in time-dependent viscoelastic flows.

Group Productivity

Publications in peer review Journals

A. M. Afonso, M.A. Alves , R.J. Poole, P.J. Oliveira, F.T. Pinho (2011), “Viscoelastic Flows in Mixing-Separating Cells”, Journal of Engineering Mathematics, Vol. 71, No. 1, pp. 3-13.

A. M. Afonso, P.J. Oliveira, F.T. Pinho, M.A. Alves (2011), “Dynamics of High-Deborah-Number Entry Flows: A Numerical Study”, Journal of Fluid Mechanics, Vol. 677, No. , pp. 272-304.

C.M. Xisto, J.C. Páscoa, P.J. Oliveira, D.A. Nicolini (2012) “An Hybrid Pressure-Density Based Algorithm for the Euler Equations at All Mach Number Regimes”, International Journal for Numerical Methods in Fluids, in press.

M.I.A. Ferra, J.R. Graça, A.M.M. Marques (2011) “Ionization of Acetic Acid in Aqueous Potassium Chloride Solutions” J. Chem. Eng. Data, 56, 3673-3678.

Group Productivity

A.J. Mendonça; M. Inês; A.P. Esteves; D.I. Mendonça; M.J. Medeiros (2011) "Kolbe electrosynthesis of 1,2-di(bicyclo[2.2.1]heptan-2-yl)ethane and 1,2-diphenylethane", *Synthetic Communications*, 41, 820-825.

F. Silva, S. Ferreira, A. Duarte, D.I. Mendonça, F.C. Domingues (2011) "Antifungal activity of Coriandrum sativum essential oil, its mode of action against Candida species and potential synergism with amphotericin B", *Phytomed.* 19, 42– 47.

R.C.S. Mata, D.I. Mendonça, L. Vieira, A.F. dos Santos, L.A. da Silva, J.F. Gaspar, C. Martins, J. Rueff, A.E.G. Sant'Ana (2011) "Molluscicidal activity of compounds isolated from Euphorbia conspicua N. E. Br." *J. Braz. Chem. Soc.*, 10, 1880-1887.

Y.G.P. Blanco, D.K. Bicayi, L.H. Isla, D.I. Mendonça, B.V. Batis (2011) "Effect of plant extracts on growth and spore germination of Alternaria solani (E. & M.) J. & G. under in vitro conditions." *Rev. Iberoam. Micol.* 28, 60-60.

M.J. Pacheco, V.Santos, L.Ciriaco, A. Lopes (2011) "Electrochemical degradation of aromatic amines on BDD electrodes. *Journal of Hazardous Materials*, 186 (2-3) 1033-1041.

L. Ciriaco, D. Santos, M.J. Pacheco, A. Lopes (2011) "Anodic oxidation of organic pollutants on a Ti/SnO(2)-Sb(2)O(4) anode", *Journal of Applied Electrochemistry*, 41(5) 577-587.

J.C. Diogo, A. Morao, A. Lopes (2011)" Persistent Aromatic Pollutants Removal Using a Combined Process of Electrochemical Treatment and Reverse Osmosis/Nanofiltration", *Environmental Progress & Sustainable Energy*, 30 (3) 399-408.

S. Sobreira, M.J. Pacheco, L. Ciriaco, A. Lopes (2011) "Effect of the Hydrodynamic Conditions on the Electrochemical Degradation of Phenol on a BDD Anode", *Portugaliae Electrochimica Acta*, 29(5), 343-348.

C. Ascensão, L. Ciriaco, M.J. Pacheco, A. Lopes (2011) "Metal Recovery from Aqueous Solutions", *Portugaliae Electrochimica Acta*, 29(5) 349-359

T. Frade, A. Gomes, M.I.S. Pereira, A. Lopes, L. Ciriaco (2012) Fotoeletrodegradação do corante AO7 utilizando filmes de nanocompósitos de ZnO TiO2 . *Química Nova*, in press, accepted in 18/5/11; published on the web in 8/7/2011

A. Gomes, T. Frade, K. Lobato, M. E. Melo Jorge, M. I. da Silva Pereira, L. Ciriaco, A. Lopes (2012) "Annealed Ti/Zn-TiO2 nanocomposites tested as photoanodes for the degradation of Ibuprofen", *J Solid State Electrochem.* in press. On-line: 19/12/2011. DOI 10.1007/s10008-011-1608-0.

A. Fernandes, M.J. Pacheco, L. Ciriaco, A. Lopes (2012) Anodic oxidation of a biologically treated leachate on a boron-doped diamond anode, *Journal of Hazardous Materials*, 199–200, 82– 87.

Other international publications

J.M Malheiro, P.J. Oliveira, F.T. Pinho (2011) "Secondary Flows of Viscoelastic Fluids in a Curved Duct of Square Cross-Section", *Rheology Trends: From Nano to Macro Systems*, IBEREO 2011, Ed. M.T. Cidade, I.M.N. Sousa, J.M. Franco, pp. 95-98 (ISBN 978-972-8669-50-8).

I.C. Gonçalves, A. Fonseca, A.M. Morão, H.M. Pinheiro, A.P. Duarte, M.I. Ferra, (2011) "Bioremediation of agro-industrial residues and an industrial effluent", In Conference Proceedings of 5th European Bioremediation Conference, Chania, Crete, 4-7 July 2011, Kalogerakis, N. and Fava, F., ID 011, pg:213.

Group Productivity

A. Fernandes, L. Ciriaco, M.J. Pacheco and A. Lopes (2011) "Anodic oxidation of leachates from sanitary landfills", In Book of Proceedings of the 1st International Conference WASTES:Solutions, Treatments and Opportunities, (ISBN 978-989-97429-1-8) pages 235-239. September 12th – 14th, Guimarães, Portugal.

F. Silva, S. Ferreira, A. Duarte, D. I. Mendonça, F. C. Domingues (2011) "Antifungal activity of Coriandrum sativum essential oil, its mode of action against Candida species and potential synergism with amphotericin" IV International Conference on Environmental, Industrial and Applied Microbiology (Biomicroworld 2011) Torremolinos, Espanha, 14-16 Setembro 2011.

Other national publications

J. Malheiro, P.J. Oliveira, F.T. Pinho (2011). Laminar Newtonian flows in square curved ducts at moderate Reynolds number. Livro de actas do Seminário Indústria Têxtil e Papeleira: Materiais e Processos Inovadores (ISBN 978-989-654-074-6) pgs 27-30, UBI, Covilhã, Portugal.

H. M. Matos, P. J. Oliveira (2011). Non-Newtonian Flows in Two dimensional T-junctions. Livro de actas do Seminário Indústria Têxtil e Papeleira: Materiais e Processos Inovadores (ISBN 978-989-654-074-6) pg 56-59, UBI, Covilhã, Portugal.

M. Magrinho, A.R. Santos, D. Mota, J. Matos, A. Faria (2011), "Síntese e estudo de materiais poliméricos baseados no polipirrol". Livro de actas do Seminário Indústria Têxtil e Papeleira: Materiais e Processos Inovadores (ISBN 978-989-654-074-6) pg 116-119, UBI, Covilhã, Portugal.

S.S. Ramos, L. V. Reis, P. F. Santos, P. Almeida (2011), "Hydrolysis of 3-Alkyl-2-methylbenzoazol-3-ium iodides: an Useful Reaction". Livro de actas do Seminário Indústria Têxtil e Papeleira: Materiais e Processos Inovadores (ISBN 978-989-654-074-6) pg 54-55, UBI, Covilhã, Portugal.

T. Frade, A. Videira, A. Gomes, M. I. da Silva Pereira, O. Monteiro, L. Ciriaco, A. Lopes (2011). Filmes de nanocompósitos: sua utilização na Fotoelectrodegradação do Corante AO7. Livro de actas do Seminário Indústria Têxtil e Papeleira: Materiais e Processos Inovadores (ISBN 978-989-654-074-6) pg 39-42, UBI, Covilhã, Portugal.

D. Santos, L. Ciriaco, M.J. Pacheco, A. Lopes (2011). Anodic oxidation of the dye Acid Orange 7 at different anode materials. Livro de actas do Seminário Indústria Têxtil e Papeleira: Materiais e Processos Inovadores (ISBN 978-989-654-074-6) pg 47-49, UBI, Covilhã, Portugal.

P. Rodrigues, D. Norma, M.J. Pacheco, L. Ciriaco, A. Lopes (2011). Electrocoagulation of leachates from sanitary landfills. Livro de actas do Seminário Indústria Têxtil e Papeleira: Materiais e Processos Inovadores (ISBN 978-989-654-074-6) pg 64-65, UBI, Covilhã, Portugal.

S. Sério, G. Martins, M.E. Melo Jorge, Y. Nunes, M. I. S. Pereira, M.J. Pacheco, L. Ciriaco, A. Lopes (2011). Novel strategy of oxide type electrodes preparation for electrolytic treatment technologies. Livro de actas do Seminário Indústria Têxtil e Papeleira: Materiais e Processos Inovadores (ISBN 978-989-654-074-6) pg 75-78, 2-3 Dezembro, UBI, Covilhã, Portugal.

M.J.R.G. Pires, M.I.A. Ferra, A.M.M.M.B. Amaro, I.M.S.C. Gonçalves (2010). Influence of pH on the molecular structure of four azo dyes. Livro de actas do Seminário Indústria Têxtil e Papeleira: Materiais e Processos Inovadores (ISBN 978-989-654-074-6) pg 69-70, UBI, Covilhã, Portugal.

S. Sobreira, M.J. Pacheco, L. Ciriaco, A. Lopes (2011). Electrochemical degradation of the amine 8-aminonafalene-1-sulfonic acid: Influence of stirring and flow rate. Livro de actas do Seminário Indústria Têxtil e Papeleira: Materiais e Processos Inovadores (ISBN 978-989-654-074-6) pg 108-111, UBI, Covilhã, Portugal.

Group Productivity

A.S. Rodrigues, M.J. Pacheco, L. Ciriaco, A. Lopes (2011). Electrochemical degradation of 8-aminonaphthalene-2-sulfonic acid: a comparative study between Si/BDD and Ti/Pt/PbO₂ anodes. Livro de actas do Seminário Indústria Têxtil e Papeleira: Materiais e Processos Inovadores (ISBN 978-989-654-074-6) pg 120-122, UBI, Covilhã, Portugal.

A.M.M.B. Amaro, E.M. Fernandes, M.H.B. Nunes, M.I.A. Ferra, M.J.R.G.R. Pires (2011). Comparação de métodos analíticos para a determinação do teor de sulfato e nitrato na água das ribeiras Degoldra e Carpinteira. Livro de actas do Seminário Indústria Têxtil e Papeleira: Materiais e Processos Inovadores (ISBN 978-989-654-074-6) pg 91-92, UBI, Covilhã, Portugal.

I.C. Gonçalves, A. Fonseca, A.M. Morão, H.M. Pinheiro, A.P. Duarte, M.I.A. Ferra (2011). Anaerobic biodegradation of spent brewery and aromatic compounds. Livro de actas do Seminário Indústria Têxtil e Papeleira: Materiais e Processos Inovadores (ISBN 978-989-654-074-6) pg 103-104, UBI, Covilhã, Portugal.

E.M.J. Catalão, J.R. Graça (2011). Estabilidade e especiação de complexos metálicos de L-lisina em soluções de cloreto de potássio. Livro de actas do Seminário Indústria Têxtil e Papeleira: Materiais e Processos Inovadores (ISBN 978-989-654-074-6) pg 105-107, UBI, Covilhã, Portugal.

Ph.D. thesis completed

Hélder Miguel Marmela Matos (Ph.D, UBI; FCT grant - SFRH/BD/18062/2004)

"Modelação de Escoamentos em Bifurcações Envolvendo Líquidos Não Newtonianos", March 2011, Supervisor: P.J. Oliveira.

Organization of conferences

International

P.J. Oliveira - Member of the Scientific Committee and Charmain of the session "Non-Newtonian Fluid Mechanics" in the IBEREO Iberian Meeting on Rheology (SPR), FCT – Univ. Nova, Caparica, 7-9 Setembro 2011.

National

P.J. Oliveira - Member of the Scientific Committee of the Congresso de Métodos Numéricos em Engenharia CMNE 2011 (SEMNI e APMTAC), University of Coimbra, 14 – 17 Junho 2011.

A. Lopes, D.I. Mendonça, A.M. Amaro- Members of the Scientific Committee of the "Simpósio 2011 – Materiais e Processos Inovadores, Unidade Materiais Têxteis e Papeleiros", University of Beira Interior, Covilhã, 15-16 December 2011.

A. Lopes, M.J.Pacheco, S. Ramos - - Member of the Organizing Committee of the "Simpósio 2011 – Materiais e Processos Inovadores, Unidade Materiais Têxteis e Papeleiros", University of Beira Interior, Covilhã, 15-16 December 2011.

Internationalization

Group Productivity

P.J. Oliveira - Editorial Board of the ISRN Applied Mathematics, Hindawi Pub. Corporation. (Open access journal) (<http://www.hindawi.com/isrn/appmath/editors/>)

P.J. Oliveira - Member of the jury of the "Prize for the Best Luso-Spanish Doctoral Thesis in Rheology (from SPR- Sociedade Portuguesa de Reologia and GER- Grupo Espanhol de Reologia).

A. Lopes - Portuguese Delegate of the EuCheMS Division of Chemistry and the Environment (DCE).

A. Lopes - Supervisor of a 3-month internship of the post-doc Carmen Ionela Brinzila, PhD, called "Anodic oxidation of pharmaceutical compounds" as part of her theme of post-doctorate on "Electrochemical Advanced Oxidation Processes (EAOPs) Applied for destruction of refractory contaminants from wastewater "4D- funded by the postDoc project" Development and support of multidisciplinary postdoctoral programs in technical domains of the national strategy for research-development and innovation ", whose mentor is Dr. Romeo Cristian Ciobanu, Ph.D., Faculty of Electrical Engineering, "Gheorghe Asachi" Technical University of Iasi, Romania.

A. Lopes - Supervisor of Agnieszka Rogalewska (Polish nationality) under the program "Training Agreement and Quality Commitment, LLP - ERASMUS Programme" from August 11, 2011, for a period of three months.

Strategic Project Adjustments