

Instituto de Ciência e Engenharia de Materiais e Superfícies (Lisboa) - ICEMS [84]

[[Página principal](#) > [Relatório científico 2005](#)]

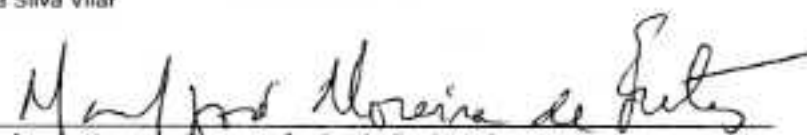
Lacrado em 05-05-2006 11:13:00

Indicadores de execução relativos a 2005 - Projecto Global**Indicadores de execução 2005**

| | Previsto | Realizado |
|--|----------|-----------|
| A - Publicações | | |
| Livros | 4 | 14 |
| Artigos em revistas internacionais | 78 | 80 |
| Artigos em revistas nacionais | 7 | 9 |
| B - Comunicações | | |
| Em congressos científicos internacionais | 74 | 175 |
| Em congressos científicos nacionais | 30 | 19 |
| C - Relatórios | 0 | 21 |
| D - Organização de seminários e conferências | 3 | 5 |
| E - Formação Avançada | | |
| Teses de Doutoramento | 6 | 10 |
| Teses de Mestrado | 5 | 1 |
| Outra | 0 | 1 |
| F - Modelos | 4 | 0 |
| G - Aplicações computacionais | 3 | 1 |
| H - Instalações Piloto | 0 | 1 |
| I - Protótipos laboratoriais | 4 | 1 |
| J - Patentes | 2 | 8 |

Relatório científico por sub-projecto

| Sub-projecto | Investigador responsável |
|-----------------|------------------------------------|
| Sub-project | Sub-project leader |
| MATECHEMPRO | Maria Norberta Neves Correia Pinho |
| 5Mat | Luis Manuel Guerra Silva Rosa |
| PRECHAMAT | Rui Mario Correia Silva Vilar |
| Total: 3 | |

Data: sexta-feira, 5 de Maio de 2006
(assinatura do Responsável pelo Projecto)

05-05-2006 - 14:11

 UNIÃO EUROPEIA - Fundos Estruturais Governo da República PortuguesaCiência, Inovação
2010 Programa Operacional Ciência e Inovação 2010

Instituto de Ciência e Engenharia de Materiais e Superfícies (Lisboa) - ICEMS [84]

[[Página principal](#) > [Relatório científico 2005](#)]

Sub-projecto

Sub-project

Preparation and characterisation of multifunctional surfaces and thin films

Investigador responsável

Project leader

Rui Mario Correia Silva Vilar

Resumo da actividade desenvolvida

The activities of UCESPF cover mainly the area of surface and interface science and technology and functional thin films for optoelectronic and magnetic applications.

1 - Surface and interface science and technology

A - Laser surface treatment and laser-assisted rapid manufacturing

Laser powder deposition is being used as a coating technique, to build 3D objects and as a non-equilibrium synthesis technique for combinatorial materials design. The following research lines were pursued in 2005:

Al- and Cu-based MMCs and Al-transition metals alloys for rapid tooling applications (PhD thesis of R. Anandkumar and T. Marques and FCT projects RapidTool and CuCoMat, in collaboration with Plasdan, Marinha Grande, Portugal and INETI).

Rapid manufacturing of metallic prosthesis (PhD thesis of C. Meacock and A. Sérgio, RAMATI project).

Laser-assisted superalloy single crystal growth (PhD thesis of E. C. Santos in collaboration with TWI, ITN, and Rolls Royce plc).

Laser-assisted combinatorial design of MMCs and Ti-based biomaterials (RAMATI and Pósduros projects, in collaboration with TE&M, post-doctoral work of S. Barradas).

Laser surface texturing and functionalisation for biomedical applications (Texmed project, post doctoral work of V. Oliveira and PhD thesis of M. Sivakumar).

B - Micro and nanotribology

Mechanisms of wear, energy dissipation and surface damage in Ni-Co alloys at the micro and nanoscales (PhD thesis of S. Graça, Nanonico project)

C - Development of environmentally friendly technologies for corrosion protection

New surface pre-treatments for protection of Al alloys and coil coated galvanized steel and Mg alloys based on inorganic-organic hybrid films.

Corrosion behaviour of formed parts and cut edges of painted substrates, focusing on the development of self-healing coatings.

D - Corrosion Studies

Corrosion behaviour of memory shape alloys for biomedical applications (initiated during 2005).

Fundamental studies on the passivity of metals and alloys.

Use of microelectrodes for the establishment of criteria for deeper understanding of results obtained from electrochemical localised techniques measurements.

E - Interfaces in metal/ceramic or ceramic/ceramic based systems

Study of new production routes for tougher ceramic and metal matrix composites and relations between interface characteristics, production opportunities and properties.

Development of a computer program to build, view and analyse atomic structures - GAMGI (<http://www.gamgi.org/>).

2 - Functional thin films for optoelectronic and magnetic applications

A - Glasses and thin films for photonics and integrated optics

Preparation of silicate glass active optical planar waveguides by sol-gel processing, doped with Er³⁺ ions and Ag nanoparticles (Ph.D. thesis of Ana C. Marques, in collaboration with the University of Trento (Italy) and ITN (Sacavém)).

Preparation and development of one- and three-dimensional photonic bandgap (PBG) structures, prepared by sol-gel processing (in collaboration with the university of Trento, through the GRICES-CNR program), including rare-earth doped microcavities and colloidal photonic crystals (opals and inverted opals).

Characterization of chalcogenide glass films on Si substrates, prepared by physical vapour deposition at Lehigh University (USA), in the framework of a collaboration between IST and the International Materials Institute "New functionality in glass" (sponsored by NSF, USA). Preparation and physical characterization of glass samples in the (Ge,Si)O₂-(Na,K, Rb)2O-(Nb,V)2O₅ system (in collaboration with the University of Clausthal, Germany).

Structural and optical characterisation of semiconductor nanocrystals in amorphous matrices for optoelectronic applications (in collaboration with Minho University)

B - Thin films and materials for spin electronics and magnetic applications

Growth of polycrystalline magnetite (Fe₃O₄) films onto insulators, e.g. Al₂O₃ (0001), and semiconductors such as Si(100) and GaAs (100) by pulsed laser deposition and their characterisation (EU project FENIKS, in collaboration with FORTH, Greece)

Spin-dependent transport measurements in low temperature growth of CrO₂ films by conventional and KrF laser CVD (PhD thesis of P.M. Sousa and research work of S.A. Dias, FCT project POCTI/CTM/41413/2001, in collaboration with Imperial College, UK).

Growth of dilute magnetic semiconductors (DMS) based on Co-doped TiO₂ by pulsed laser deposition (PhD thesis of N. Popovic, in collaboration with Imperial College, UK)

Synthesis of room temperature DMSs by low temperature deposition methods - photolytic laser CVD and sol-gel processing (research work of D. Vasconcelos, FCT project POCTI/CTM/57019/2004, in collaboration with Chemistry Dept.- FCUL).

Characterisation of magnetic RFe₁₂-xMx intermetallic compounds (R = rare earth and M = late 3d transition metal) by TEM and Lorentz microscopy (MicroLorentz project)
 Structural characterization of new new Y and U borides and borocarbides with Fe, Ni, Pd or Pt.
 Characterisation of FeCr alloys compounds by Mössbauer spectroscopy.
 Magnetic behaviour of magnetic materials thin films and multilayers by Mössbauer spectrometry and magnetoresistance measurements.

C - Thin films for electronic applications

Degradation of a-Si:H based p-i-n detectors (in collaboration with ISEL, UALG, and ITN).
 Transient photocurrents and photoluminescence in pulsed-laser-deposited GaN (in collaboration with HMI Berlin and UNL).

D -SPM Studies

Self-assembled silicon nano-crystals (SAS) by 2D nanoindentation matrix patterning by the Scanning Probe Microscope (SPM) tip.
 Nanosized patterning technology (nanoPAT) using the SPM in modified electropulsed mode.
 SPM studies of films prepared from liquid-crystalline aqueous solutions and application as alignment layers of a bistable ferroelectric device, of human serum albumin absorption on TiO₂, and of nanoscale pattern formation in Langmuir-Blodgett films.

Indicadores de execução 2005

| | Previsto | Realizado |
|---|----------|-----------|
| A - Publicações | | |
| Livros | 1 | 10 |
| Artigos em revistas internacionais | 40 | 49 |
| Artigos em revistas nacionais | 2 | 5 |
| B - Comunicações | | |
| Em congressos científicos internacionais | 26 | 92 |
| Em congressos científicos nacionais | 5 | 10 |
| C - Relatórios | 0 | 10 |
| D - Organização de seminários e conferências | 1 | 4 |
| E - Formação Avançada | | |
| Teses de Doutoramento | 2 | 6 |
| Teses de Mestrado | 2 | 0 |
| Outra | 0 | 0 |
| F - Modelos | 0 | 0 |
| G - Aplicações computacionais | 0 | 1 |
| H - Instalações Piloto | 0 | 1 |
| I - Protótipos laboratoriais | 0 | 0 |
| J - Patentes | 0 | 0 |

Publicações em 2005

A - Publications

- Papers in international journals

Costa, L., Vilar, R., Reti, T., Deus, A. M., "Rapid tooling by laser powder deposition: Process simulation using finite element analysis", *Acta Materialia*, 53, pp. 3987-3999, 2005.

Carvalho, P. A., Fonseca, I., Marques, M. T., Correia, J. B., Almeida, A., Vilar, R., "Characterization of copper-cementite nanocomposite produced by mechanical alloying", *Acta Materialia*, 53, pp. 967-976, 2005.

Marques, M. T., Livramento, V., Correia, J. B., Almeida, A., Vilar, R., "Production of copper-niobium carbide nanocomposite powders via mechanical alloying" *Materials Science and Engineering A*, 399, pp 382-386, 2005.

Cheung, N., Pinto, M. A., Ierardi, M. C. F., Garcia, A., Vilar, R., "Steel Surface Treatment Using Laser Remelting: Mathematical Modeling and Experimental Analysis", *Lasers in Engineering*, 15, 41-53, 2005.

Colaco, R., Vilar, R., "Tribological properties of laser processed Fe-Cr-C alloys", *Materials Science Forum*, 473-474, pp. 53-58, 2005.

Costa, L., Vilar, R., Reti, T., Colaco, R., Deus, A.M., Felde, I., "Simulation of phase transformations in steel parts produced by laser powder deposition", *Materials Science Forum*, 473-474, pp. 315-320, 2005.

Colaco, R., Vilar, R., "On the influence of retained austenite in the abrasive wear behaviour of a laser surface melted tool steel", *Wear*, 258, 225-231, 2005.

Fernandes, A., Utkin, A., Lavrov, A., Vilar, R., "Design of committee machines for classification of single-wavelength lidar signals applied to early forest fire detection", *Pattern Recognition Letters*, 26, , pp. 625-632, 2005.

Eugénio, S., Sivakumar, M., Vilar, R., "Surface Treatment of Human Dentin by KrF Laser", *Materials Science Forum*, 473-474, pp. 1044-1048, 2005.

Oliveira, V., F. Simões, Vilar, R., "Column growth mechanisms during KrF laser micromachining of Al₂O₃-TiC ceramics", *Applied Physics A: Materials Science and Processing*, Vol.81, p. 1157-1162, 2005.

Borisov, V.V., Reutova, N.M., Utkin, A.B. "Electromagnetic waves produced by a travelling current pulse with high-frequency filling". *J. Phys. A*, 38, p. 2225-2240, 2005.

Dias, D., Carvalho, P. A., Ferro, A., Löhwasser, W., "MnO₂ counter-electrode structure in Ta capacitors: A TEM study", *Acta Materialia*, 53, 4723-4732, 2005.

Paramês, M.L., Mariano, J., Popovici, N., Rogalski, M.S., Conde, O., "UV pulsed laser deposition of magnetite thin films", *Materials Science and Engineering B*, 118 246-249, 2005.

Samide, A., Bibicu, I., Rogalski M.S., Preda, M., "Surface study of the corrosion inhibition of carbon steel in dilute ammoniacal media using N-ciclohexil-benzothiazole-sulphenamida", *Corrosion Science*, 47, 1119-1127, 2005.

Eugénio, Sónia, Sivakumar, Manickam, Vilar, R., Rego, Ana Maria, "Characterisation of dentin surfaces processed with KrF excimer laser radiation", *Biomaterials* 26, 6780-6787, 2005.

- Marques, A.C., Cabeça, R., Almeida, R.M., Zampedri, L., Chiasera, A., Ferrari, M., "The effects of TiO₂ on the structure and spectroscopic properties of silica-hafnia based sol-gel waveguides", *Glass Technology*, 46, 50-54, 2005.
- Zampedri, Luca, Tosello, Cristiana, Portales, Hervé, Montagna, Maurizio, Matarelli, Maurizio, Chiappini, Andrea, Righini, Giancarlo C., Peñil, Stefano, Conti, Gualtiero Nunzi, Martino, Maurizio, Portal, Sabine, Marques, Ana C., Almeida, Rui M., Jestin, Yoann, Ferrari, Maurizio, Chiasera, Alessandro, "Spectroscopic assessment of rare-earth activated planar waveguides and microcavities", *Applied Surface Science*, 248, 3-7, 2005.
- Almeida, Rui M., Marques, Ana C. and Portal, Sabine, "Glassy and nanocrystalline photonic materials and structures by sol-gel", *Optical Materials*, 27, 1718-1725, 2005.
- Matarelli, M., Montagna, M., Chiasera, A., Ferrari, M., Zampedri, L., Righini, G.C., Fortes, L.M., Gonçalves, M.C., Santos, L.F., Almeida, R.M., "Self-absorption and radiation trapping in Er³⁺-doped TeO₂ based glasses", *Europhys. Lett.*, 71, 394 - 399, 2005.
- Santos, Luis F., Wolhuis, Rolf, Koljenovic, S., Almeida, Rui M., Puppels, Gerwin, J., "Fiber-optic Probes for in Vivo Raman Spectroscopy in the High-Wavenumber Region", *Anal. Chem.*, 77, 6747 - 6752, 2005.
- Koljenovic, S., Bakker Schut, T.C., Wolhuis, R., Jong, B. de, Santos, L.F., Caspers, P.J., Kros, J.M., Puppels, G.J., "Tissue characterization using high wavenumber Raman spectroscopy", *J. of Biomedical Optics*, 10, 031116, 2005.
- Ramos, A.R., Marques, C.P., Alves, E., Marques, A.C. and Almeida, R.M., "Stability of erbium and silver implanted in silica-titania sol-gel films", *Nuclear Instruments and Methods in Physics Research B*, 240, 415 - 419, 2005.
- Cabral, A., Duarte, R. G., Montemor, M.F., Zheludkevich, M., Ferreira, M.G.S., "Analytical Characterisation and Corrosion Behaviour Evaluation of Bis-[Triethoxysilylpropyl]Tetrakisulfide Coatings on Aluminium Alloys", *Corrosion Science*, 47, p. 869-881, 2005.
- Carmezim, M.J., Simões, A.M., Montemor, M.F., Da Cunha Belo, M., "Capacitance Behaviour of Passive Films on Ferritic and Austenitic Stainless Steel", *Corrosion Science*, 47, p. 581-591, 2005.
- Trabelsi, W., Dhoubi, L., Triki, E., Ferreira, M.G.S., Montemor, M.F., "An electrochemical and analytical assessment on the early corrosion behaviour of galvanised steel pre-treated with aminosilanes" *Surface and Coatings Technology*, 192, p. 284-290, 2005.
- Z. Chikh, A.; Chebabe, D.; Derraj, A.; Hajjaji, N.; Shiri, A.; Montemor, M.F.; Ferreira, M.G.S.; Bastos, A.C.; "Electrochemical and Analytical study of Corrosion Inhibition on Carbon Steel in HCl Medium by 1,12-bis(1,2,4 - triazolyl) Dodecane, *Corrosion Science*, 47, p. 447-459, 2005.
- Szpyrkowicz, L., Ricci, F., Montemor, M.F., Souto, R.M., "Characterisation of the catalytic films formed on stainless steel anodes employed for the electrochemical treatment of cuprocyanide wastewaters", *Journal of Hazardous Materials*, 119, 1-3, p.145-152, 2005.
- Alves, V. A., Brett, C.M., Montemor, M. F., "Caracterização por XPS de filmes passivos formados sobre aços de baixa liga em meio de carbonato", *Química Nova*, 28, 2, p. 204-210, 2005.
- Jamil, H. E., Shrin, A., Boulif, R., Bastos, A.C., Montemor, M. F., Ferreira, M.G. S., "Corrosion behaviour of steel samples in mortar exposed to an amino alcohol based inhibitor", *Cement and Concrete Composites*, 27, 6, p.671-678 2005.
- Zheludkevich, M.L., Montemor, M.F., Salvado, I.M., Ferreira, M.G.S., "Oxide Nanoparticle Reservoirs for Storage and Prolonged Release of the Corrosion Inhibitors", *Electrochemistry Communications*, Volume 7, Issue 8, August, Pages 836-840, 2005.
- Trabelsi, W., Cecilio, P., Ferreira, M.G.S., Montemor, M.F., "Electrochemical assessment of the self-healing properties of Ce-doped silane solutions for the pre-treatment of galvanised steel substrates" *Progress in Organic Coatings*, Volume 54, Issue 4, Pages 276-284, 2005.
- Cabral, A.M., Duarte, R.G., Montemor, M.F., Ferreira, M.G.S., "A comparative study on the corrosion resistance of AA2024-T3 substrates pre-treated with different silane solutions: Composition of the films formed" *Progress in Organic Coatings*, Volume 54, Issue 4, Pages 322-331, 2005.
- Zheludkevich, M.L., Serra, R., Montemor, M.F., Yasakau, K.A., Miranda Salvado, I.M., Ferreira, M.G.S., "Nanostructured Sol-Gel Coatings Doped with Cerium Nitrate as Pre-Treatments for AA2024-T3. Corrosion Protection Performance", *Electrochimica Acta*, Volume 51, Issue 2, Pages 208-217, 2005.
- Bastos, A.C., Simões, A.M., González, S., González-García, Y, Souto, R.M., "Application of the scanning electrochemical microscope to the examination of organic coatings on metallic substrates", *Progress in Organic Coatings*, 53 p.177-182, 2005.
- Bastos, A.C., Ferreira, M.G.S., Simões, A.M., "Comparative electrochemical studies of zinc chromate and zinc phosphate as corrosion inhibitors for zinc", *Progress in Organic Coatings*, 52 p. 339- 350, 2005.
- Duarte, R. G., Bastos, A.C., Castela, A. S., Ferreira, M. G. S., "A Comparative study between Cr(VI)-containing and Cr-free films for coil coating systems", *Progress in Organic Coatings*, 52, p. 320-327, 2005.
- Rangel, C.M., Silva, T.M., Cunha Belo, M., "Semiconductor Electrochemistry Approach to Passivity and Stress Corrosion Cracking Susceptibility of Stainless Steels" *Electrochimica Acta*, 50, p. 2076, 2005.
- Zheludkevich, M.L., Ferreira, M.G.S., Miranda Salvado, I.M., "Sol-Gel Coatings for Corrosion Protection of Metals", *Journal of Materials Chemistry*, 15, 5099, 2005.
- Zheludkevich, M.L., Yasakau, K.A., Poznyak, S.K., Ferreira, M.G.S., "Triazole and Thiazole Derivatives as Corrosion Inhibitors for AA2024 Aluminium Alloy", *Corrosion Science*, 47, 3011, 2005.
- Serra, R., Zheludkevich, M.L., Ferreira, M.G.S., "Influence of the plasma polymer deposition conditions on the barrier properties of coil coated samples", *Progress in Organic Coatings*, 53, 225, 2005.
- Botelho do Rego, A. M., Ferrara, A. M., El Beghdadi, J., DeBonttridder, F., Brogueira, P., Naaman, R., Vilar, Rui, "Adsorption of Phenylphosphonic Acid on GaAs (100) Surfaces", *Langmuir*, 21, 8765, 2005.
- Beja, M., Relogio, P., Charreyre, M.T., da Silva, A. M. G., Brogueira, P., Farinha, J. P. S., Martinho, J. M. G., "Thin Films of Hydrophobically Modified Poly (N,N-dimethylacrylamide)", *Langmuir* 21, 3940, 2005.
- Brogueira, P., Dias de Deus, "Multiplicity Fluctuations in Hadron-Hadron and Nucleus-Nucleus Collisions and Percolation of Strings", *J., Acta Physica Polonica B* 36, 307, 2005.

Sanguino, P., O., Teodoro, M. N. D., Niehus, M., Marques, C. P., Moutinho, A. M. C., Alves, E., Schwarz, R., "Structural and Composition Analysis of GaN Films Deposited by Cyclic PLD at Different Substrate Temperatures", *Sensors and Actuators A* 121, 131 - 135, 2005.

Amaral, A., Nunes de Carvalho, C., Brogueira, P., Lavareda, G., Melo, L. V., Godinho, M. H., "ITO Properties on Anisotropic Flexible Transparent Cellulosic Substrates under Different Stress Conditions", *Mat Sci Eng B*, 118 (1-3) 183-186, 2005.

Paramês, M.L., Mariano, J., Rogalski, M.S., Popovici, N., Conde, O., "UV pulsed laser deposition of magnetite thin films", *Mater. Sci. and Eng. B* 118, 246-249, 2005.

Sousa, P.M., Silvestre, A.J., Popovici, N., Conde, O., "Morphological and structural characterization of CrO₂/Cr₂O₃ films grown by Laser-CVD", *Appl. Surface Sci.* 247, 423-428, 2005.

Silva, J.P., Silvestre, A.J., "Comparing a current-carrying circular wire with polygons of equal perimeter: Magnetic field versus magnetic flux", *Eur. J. Phys.* 26, 786-790, 2005.

Dias, D., Carvalho, P. A., Ferro, A. C., Lohwasser, W., "MnO₂ Counter-Electrode Structure in Ta Capacitors: A TEM Study", *Acta Materialia* 53, 4723-4732, 2005.

- Papers in national journals

Serra, R., Zheludkevich, M.L., Montemor, M.F., Ferreira, M.G.S., "Estudo das Propriedades Estruturais e de protecção Contra a Corrosão de Revestimentos Nanoestruturados Híbridos derivados de Sol-Gel Para o Alumínio AA2024-T3, *Corrosão e Protecção dos Materiais*, vol. 24, nº1, 2005.

Duarte, R. G., Castela, A. S., Ferreira, M. G. S., "Estudo comparativo entre sistemas de matérias pré-pintados com cromo e sem cromo", *Corrosão e Protecção dos Materiais*, 24, p. 40-45, 2005.

Kilubi, E., Bocchi, N., Ferreira, M. G. S., Cunha Belo, M., Carnezim, M. J., "Colouration of Stainless Steel", *Ciência e Tecnologia dos Materiais*, 17, p.23, 2005.

Silva, Moura e Silva, Carnezim, M.J., Fernandes, J.C.S., "Nitinol - A new material for biomedical applications" *Ciência e Tecnologia dos Materiais*, 17, p.34, 2005.

Fernandes, J.C.S., "O Fenómeno da Corrosão" (Parte II), *Arquitectura e Vida*, 56, 80, 2005.

- Books and chapters of books

Rogalski, M.S., Palmer, S. B. - *ADVANCED UNIVERSITY PHYSICS*, 2nd edition, 1024 págs, Chapman and Hall/CRC, 2005, ISBN: 1584885114

Gonçalves, M^a. Clara, Margarido, F., Colaço, R., Eds, *Materiais de Construção - Guia de Utilização*, , 311 págs, Loja da Imagem - Mkt, ISBN: 972-98882-3-X, 2005.

Colaço, R., "Aços", Cap. 3, in *Materiais de Construção - Guia de Utilização*, pp. 52-75, M^a. Clara Gonçalves, F. Margarido e Colaço, R. Eds, 311 págs, Loja da Imagem - Mkt, ISBN: 972-98882-3-X, 2005.

Almeida, R.M., editor of Vol. 2 of the *Handbook of Sol-Gel Science and Technology*, "Characterization and Properties of Sol-Gel Materials and Products", Kluwer Academic Publishers, London, 2005.

Gonçalves, M.C., "Vidros", in: *Materiais de Construção: Guia de Utilização*, ed. M. Clara Gonçalves, Fernanda Margarido, Rogério Colaço, Loja da Imagem, pp. 176-210, Lisboa, 2005.

Almeida, R.M. and Xu, J., "Sol-Gel Processing of Sulfide Materials", in: *Handbook of Sol-Gel Science and Technology*, Vol. 1, ed. H. Kozuka, Kluwer Academic Publishers, pp. 225-244, London, 2005.

Almeida, R.M., Marques, A.C., "Characterization of Sol-gel Materials by Infrared Spectroscopy", in: *Handbook of Sol-Gel Science and Technology*, Vol. 2, ed. R.M. Almeida, Kluwer Academic Publishers, pp. 65-90, London, 2005.

Montemor, M.F., "Materiais de Construção: Guia de Utilização", Eds. Loja da Imagem/Arquitectura e Vida / Engenharia e Vida; Capítulo 1, p. 006; 2005.

Fernandes, J.C.S., Montemor, M.F., "Materiais de Construção: Guia de Utilização", Eds. Loja da Imagem/Arquitectura e Vida / Engenharia e Vida; Capítulo 10, p. 246, 2005.

Paramês, M.L., Popovici, N., Sousa, P.M., Silvestre, A.J., Conde, O., "Iron oxide thin films grown by pulsed laser deposition", in *Recent Advances in Multidisciplinary Applied Physics, Proceedings 1st Intern. Meeting on Applied Physics, APHYS-2003*, Elsevier, p. 457, 2005 (ISBN: 0-08-044648-5).

B - Communications

- In international meetings

Costa, L., Vilar, R., Reti, T., "Laser powder deposition of tool steels: strategies leading to homogeneous parts", *III International Materials Symposium, Materials 2005 and XII Encontro da Sociedade Portuguesa de Materiais*, Aveiro, Portugal, 20-23 March, 2005.

Livramento, V., Marques, M. T., Correia, J. B., Almeida, A., Vilar, R., "Preparation of dispersion-strengthened coppers with niobium carbide and niobium boride by mechanical alloying", *III International Materials Symposium, Materials 2005 and XII Encontro da Sociedade Portuguesa de Materiais*, Aveiro, Portugal, 20-23 March, 2005.

Almeida, A., Carvalho, P. A., Vilar, R., "Laser Developed Al-Cr Surface Alloys: Microstructure", *Mechanical and Wear Behaviour*, *III International Materials Symposium, Materials 2005 and XII Encontro da Sociedade Portuguesa de Materiais*, Aveiro, Portugal, 20-23 March, 2005.

Graça, S., Colaço, R., Vilar, R., "Using atomic force microscopy to retrieve nanomechanical surface properties of materials", *Materiais 2005, III International Materials Symposium and XII Portuguese Materials Society Meeting*, Aveiro, Portugal, 20-23 March, 2005.

Sivakumar, M., Oliveira, V., Vilar, R., "Surface Texture Development in KrF Excimer Laser Ablation of Dentin", III International Materials Symposium, Materials 2005 and XII Encontro da Sociedade Portuguesa de Materiais, Aveiro, Portugal, 20-23 March, 2005.

Borioli, C., Colaço, R., Vilar, R., "A comparative study on the dry sliding wear behaviour of laser clad Fe-, Ni- and Co- based coatings", WoM - 15th International conference on Wear of Materials, San Diego, USA, April 22-28, 2005.

Gonçalves, A.P., Cascals, A.S., Carvalho, P. A., Dias, M., Alves, L., Tougaif, O., Noel, H., "Synthesis and characterization of ternary borides: the U-Fe-B system", 35th Journées des Actinides, Baden, Austria 23-26, April 2005.

Vilar, R., "Manufacturing of Single Crystalline Parts by Laser Powder Deposition", AMT 2005 Advanced Manufacturing Technologies, London, Ontario, Canada (invited), 16-18 May, 2005.

Navas, C., Colaço, R., Damborenea, J. de, Vilar, R., "Abrasive wear of NiCrBSi coatings obtained by different deposition techniques", IBERTRIB 2005 - III Congresso Ibérico de Tribologia, Guimarães, Portugal, 16 - 17 June, 2005.

Graça, S., Colaço, R., Vilar, R., "Factors affecting nanotribological property measurements using atomic force microscopy, 4th ESF-Nanotribology Workshop, Porquerolles, France, 18-22 June, 2005.

Graça, S., Colaço, R., Vilar, R., "Scale dependence of indentation and scratch response of Ni-Co alloys", 4th ESF-Nanotribology Workshop, Porquerolles, France, 18-22 June, 2005.

Vilar, R., Eugénio, S., "KrF Excimer Laser Treatment of Human Dentin", Third International WLT-Conference on Lasers in Manufacturing 2005, Munich, June, 2005.

Utkin, A.B., "Waves produced by a traveling line current pulse with high-frequency filling. International Seminar", Days on Diffraction - 2005, St. Petersburg University, St. Petersburg, Russia, June 28 - July 1, 2005.

Marques, M. T., Livramento, V., Correia, J. B., Almeida, A., Vilar, R., "Study of early stages of Cu-NbC nanocomposite synthesis", ISMANAM05-12th International Symposium on Metastable and Nano Materials, Paris, France, 3 - 7 July, 2005.

Carvalho, P. A., Dias, D., Ferro, A. C., Monteiro, R., Lohwasser, W., "TEM Investigation of Counter-Electrode Structure in Ta Capacitors", Microscopy and Microanalysis 2005, Honolulu, Hawaii, 31 July - 4 August, 2005.

Alves de Matos, A.P., Carvalho, P. A., Almeida, A., Duarte, L., Vilar, R., Leitão, J., "Ultrastructural and EDS Study of Sialyolysis of the Salivary Glands", Microscopy and Microanalysis 2005, Honolulu, Hawaii, 31 July - 4 August, 2005.

Oliveira, V., Vilar, R., "Column Growth Mechanisms During KrF Laser Micromachining of Al₂O₃-TiC Ceramics", EUROMAT 2005 - European Congress on Advanced Materials and Processes, Praga, República Checa, 5-8 September, 2005.

Godinho, M. H., Trindade, A. C., Figueirinhas, J. L., Melo, L. V., Brogueira, P., Deus, A. M., Teixeira, P. I. C., "Tunable micro- and nano-periodic structures in a free-standing flexible urethane/urea elastomer film", 3rd International Conference on Liquid Crystalline Elastomers - ILCECO5, Cambridge, UK, 21-24 September, 2005.

Deus, A. M., Mazumder, J., "Three-dimensional finite element model for the calculation of temperature and residual stress fields in laser cladding, 5th Hungarian Conference and Exhibition on Materials Science", Testing and Informatics, Balatonfüred, Hungary, October, 2005.

Anandkumar, R., Colaço, R., Ocelik, V., Hossain, J. Th. M. De, Vilar, R., "Abrasive wear of AlSi/SiC(p) composite layers prepared by high power laser", 5th Hungarian Conference and Exhibition on Materials Science Testing and Informatics, Balatonfüred, Hungary, 9-11 October, 2005.

Costa, T., Serró, A. P., Pires, E., Colaço, R., "Influence of sterilization with γ -irradiation in the degradation of plasma sprayed hydroxyapatite coatings", Materials 2005, III International Materials Symposium and XII Portuguese Materials Society Meeting, Aveiro, Portugal, 20-23 March, 2005.

Gispert, M., Alves, E., da Silva, R. C., Colaço, R., Saramago, B., Serró, A. P., "Improvement of the tribological behaviour of the prosthetic pair stainless steel/ UHMPE through TiN coating and chlorine implantation of the metallic counterface", Materials 2005, III International Materials Symposium and XII Portuguese Materials Society Meeting, Aveiro, Portugal, 20-23 March, 2005.

Serró, A. P., Colaço, R., Brogueira, P., Martins, M. C., Saramago, B., "Influence of Albumin Adsorption on the Tribology of UHMWPE against counterfaces of Alumina and Co₂₈Cr₆Mo", 19th European Conference on Biomaterials, Naples, Italy, September 11-15, 2005.

Dias, D., Carvalho, P.A., Ferro, A. C., Monteiro, R., Lohwasser, W., "ESR improvement of Ta capacitors by optimisation of MnO₂ pyrolysis profile", CARTS EUROPE 2005, Prague, 17-20 October, 2005.

Sivakumar, M., Oliveira, V., Vilar, R., "Sealing of Human Dentinal Tubules by KrF 248 nm Laser Radiation", ICALEO'05 - 24th International Congress on Applications of Lasers and Electro-Optics, Laser Institute of America, Miami, EUA, 31 October to 3 November, 2005.

Almeida, A., Carvalho, P. A., Vilar, R., "Study of Laser Developed Al-Cr Surface Alloys: Microstructure, Mechanical and Wear Behavior", ICALEO 2005 - 24th International Congress on Applications of Lasers and Electro-Optics, Laser Institute of America, Miami, EUA, 31 October to 3 November, 2005.

Mota-Caetano, C., Monteiro, R., Dias, D., Carvalho, P. A., "Influence of MnO₂ crystal structure on ESR of Ta Capacitors", Tantalum International Conference, September, 2005.

Paramés, M.L., Mariano, J., Viskadourakis, Z., Popovici, N., Rogalski, M. S., Giapintzakis, J., Conde, O., "Structure and magnetic properties of low-temperature PLD magnetite thin films", Proceedings E - MRS Conference, Strassbourg, 2005.

Samide, A., Bibcu, I., Rogalski, S., Preda, M., "Mössbauer Study of the Corrosion Inhibition of Carbon Steel in Diluted Ammoniac Media using Ehylenhoare", NSTI Nanotechnology Conference, Anaheim, 2005.

Gonçalves, M.C., Brás, J., Almeida, R.M., "Sol-gel derived inverse opal photonic bandgap structures", Photon-Based Nanoscience & Technology: From Atomic Level Manipulation to Materials Synthesis & Nanobiodevice Manufacturing, NATO Advanced Study Institute, Orford (QC, Canada), September 19-29, 2005.

Almeida, R.M., Marques, Ana C., "Structure and properties of rare-earth doped, silica-based planar optical waveguides", 107th Annual Meeting of the American Ceramic Society, Baltimore (MD, USA), April 10-13, 2005.

Almeida, R.M., Marques, Ana C., "Rare-earth photoluminescence in sol-gel derived confined glass structures", 17th University Conference

on Glass Science, State College (PA, USA), June 25-29, 2005 (Invited lecture).

Fortes, L.M., Santos, L.F., Gonçalves, M. Clara, Almeida, R.M., "The effects of ZnCl₂ and ErCl₃ on the vibrational spectra and structure of tellurite glasses", 17th University Conference on Glass Science, State College (PA, USA), June 25-29, 2005.

Marques, Ana C. and Almeida, Rui M., "Silver metal particle doped glasses and waveguides for photonic applications", 13th International Workshop on Sol-Gel Science and Technology, UCLA, Los Angeles (CA, USA), August 21-26, 2005.

Marques, Ana C., Almeida, Rui M., "Raman spectra and structure of multicomponent silicate glass planar waveguides prepared by sol-gel", 13th International Workshop on Sol-Gel Science and Technology, UCLA, Los Angeles (CA, USA), August 21-26, 2005.

Almeida, Rui M., "The physico-chemical origins of color in glass", Glass Science in Art and Conservation, UNL, Lisboa, September 19-20, 2005 (Invited lecture).

Almeida, Rui M., Marques, Ana C., "Er-doped silicate glasses and planar waveguides by sol-gel processing", III International Symposium on Non-Crystalline Solids, Maringá (CR, Brasil), November 13-16, 2005 (Invited lecture).

Montemor, M.F. Trabelsi, W., Ferreira, M.G.S., Zheludkevich, M.L., "Surface evaluation and electrochemical behaviour of doped silane pre-treatments on galvanised steel substrates" Application of Electrochemical Techniques to Organic Coatings – AETOC 2005, - Villard-de-Lans, France, April 2005.

Duarte, R. G., Castela, A. S., Ferreira, M. G. S., "Influence of ageing factors on Corrosion behaviour of polyester coated systems – A EIS study", Workshop Application of Electrochemical Techniques to Organic Coatings, Villard-de-Lans France, 13-16 April, 2005.

Zheludkevich, M. L., Serra, R., Ferreira, M. G. S., "Sol-Gel coating with nanoreservoirs for corrosion inhibitors", Nanomeeting 2005, Minsk, Belarus, 24 to 27 May, 2005.

Jamil, E.H., Boulif, R., Sghiri, A., Simões, A. M., Battocchi, D., Tallman, D. E., Bierwagen, G. P., "SVET and SECM examination of the cathodic protection of aluminium using a magnesium-rich coating", Scanning Probe Microscopy, Cancun, Mexico, June, 2005.

Battocchi, D., Simões, A.M., Tallman, D.E., Bierwagen, G.P., "First World Congress on Corrosion in the Military: Cost Reduction Strategies", Sorrento, Italy, June, 2005.

Fernandes, J.C.S., Picciochi, R., Da Cunha Belo, M., Moura e Silva, T., Ferreira, M.G.S., Fonseca, I.T.E., "Alternative Anodising Processes for Aluminium and 2024 Aluminium Alloy", "CORROSION 2005" – International Conference "Science and Economy", Warsaw, Poland, June, 2005.

Pereira, A.M.R., Mendonça, M.H., Picciochi, R., Lopes, M. I., Proença, L. F., Fonseca, I.T.E., Fernandes, J.C.S., Ferreira, M.G.S., "Electro2005 - VIII Encontro Ibérico de Electroquímica, XIII Encontro da Sociedade Portuguesa de Electroquímica", Covilhã, July, 2005.

Jamil, E.H., Boulif, R., Sghiri, A., Montemor, M.F., Ferreira, M.G.S., "The Use Of Organic Corrosion Inhibitors In Concrete. Electrochemical Behaviour Of Steel Samples, In Mortar"; Apresentação por Poster, 10th European Symposium on Corrosion and Scale Inhibitors, 10th SEIC, Ferrara, Italy, August/ September 2005.

Bastos, A.C., Simões, A.M., Souto, R.M., Ferreira, M.G.S.; "Study of Galvanic Corrosion by Microelectrochemical Techniques", European Corrosion Congress – EUROCORR2005, Lisboa, Portugal, September, 2005.

Carmezim, M.J., Ferreira, M.G., Cunha Belo, M., Simões, A. M., "Electrochemical behaviour of passive layers on pure Zn", Eurocorr 2005-EUROCORR2005, Lisboa, Portugal, September, 2005.

Narciso, I.L., Carmezim, M.J., Cunha Belo, M., Simões, A.M.; "Semiconducting behaviour of Zn16Mg cast alloy in alkaline medium", European Corrosion Congress – EUROCORR2005, Lisboa, Portugal, September, 2005.

Modiano, S., Fugivarà, C.S., Duarte, R.G., Ferreira, M.G., Simões, A.M.P., Benedetti, A.V.; "Study of iron oxide degradation by hydrogen permeation through boron-alloyed steel using SVET technique", European Corrosion Congress – EUROCORR2005, Lisboa, Portugal, September, 2005.

Battocchi, D., Bierwagen, G., Simões, A.M., Stanness, A., Tallman, D., "Mg-rich primer for chromate free protective systems on Al 2024 and Al 7075", Eurocorr 2005 – EUROCORR2005, Lisboa, Portugal, September, 2005.

Montemor, M.F., Trabelsi, W., Triki, E., Zheludkevich, M., Ferreira, M.G.S., "Corrosion studies and analytical characterisation of galvanized steel substrates pre-treated with doped silane solutions" KeyNote Lecture, European Corrosion Congress – EUROCORR2005, Lisboa, Portugal, September, 2005.

Montemor, M.F., Matos, J., Simões, A.M., Fernandes, J.C., Lourenço, Z., Costa, A.S., Appleton, A.J., Ferreira, M.G. "Multiprobe chloride sensor for in-situ monitoring of reinforced concrete structures" European Corrosion Congress – EUROCORR2005, Lisboa, Portugal, September, 2005.

Zheludkevich, M.L., Serra, R., Miranda, Salvado, I.M., Montemor, M.F., Ferreira, M.G.S., "Hybrid Sol-Gel Pre-Treatments with Nanoreservoirs for Corrosion Inhibitors" European Corrosion Congress – EUROCORR2005, Lisboa, Portugal, September, 2005.

Rangel, C.M., Luz, P.P., Correia, F., Palva, T.J., Montemor, M. F., Mauricio, A., Figueiredo, C., Ferreira, M., Aires Barros, L., Thompson, G.E. "Calcareous Stone Degradation Processes And Water Transport", European Corrosion Congress – EUROCORR2005, Lisboa, Portugal, September, 2005.

Alonso, M. C., Sánchez, M., Montemor, M. F., Andrade, C.; "Hydrogen evolution on galvanized steel reinforcement pre-treated with Ce and La salts under alkaline media" European Corrosion Congress – EUROCORR2005, Lisboa, Portugal, September, 2005.

Guedes, I. C., Vieira Aoki, I., Carmezim, M.J., Montemor, M. F., Ferreira, M.G.S., Cunha Belo, M., "The Influence of Copper and Chromium on the Semiconducting Behaviour of Passive Films Formed on Weathering Steels" Apresentação por Poster, European Corrosion Congress – EUROCORR2005, Lisboa, Portugal, September, 2005.

Cabral, A., Ferreira, M. G. S., Montemor, M.F., "Corrosion Behaviour of Aluminium Alloys Pre-Treated with Bis (triethoxysilylpropyl) Tetrasulfide Solutions Doped with Ce(NO₃)₃", European Corrosion Congress – EUROCORR2005, Lisboa, Portugal, September, 2005.

Jamil, E., Boulif, R., Sghiri, A., Montemor, M. F., Ferreira, M.G. S.; "The use of organic corrosion inhibitors in concrete. Electrochemical behaviour of steel samples in mortar" Apresentação por Poster, European Corrosion Congress – EUROCORR2005, Lisboa, Portugal, September, 2005.

- Jamil, E., Boullif, R., Shriji, A., Montemor, M.F., Ferreira, M.G.S., Maghnouj, J., "The Degradation Of Reinforced Concrete Under Marine Environment" Apresentação por Poster; European Corrosion Congress - EUROCORR2005, Lisboa, Portugal, September, 2005.
- Duarte, R. G., Castela, A. S., Ferreira, M. G. S., "Influence of the solution cation Mobility on the water uptake Estimation of the PVC Platisol films by EIS", European Corrosion Congress - EUROCORR2005, Lisboa, Portugal, September, 2005.
- Moura e Silva, T., Fernandes, J.C.S., Da Cunha Belo, M., Ferreira, M.G.S., "A New Material for Neural Stimulating Prostheses", European Corrosion Congress - EUROCORR2005, Lisboa, Portugal, September, 2005.
- Jesus, C., Venâncio, J., Picciochi, R., Fernandes, J.C.S., "Hard Anodising of Copper-Rich Aluminium Alloys", Anais do "European Corrosion Congress - Eurocorr 2005", Lisboa, Portugal, September, 2005.
- Zheludkevich, M.L., Serra, R., Grundmeier, G., Ferreira, M.G.S., "Weathering resistance and barrier properties of coil coatings modified with thin plasma polymer films", Key-note, European Corrosion Congress - EUROCORR2005, Lisboa, Portugal, September, 2005.
- Yasakau, K.A., Zheludkevich, M.L., Lamaka, S.V., Shchukin, D.G., Ferreira, M.G.S., "The hybrid sol-gel coatings with nano-encapsulated corrosion inhibitors", European Corrosion Congress - EUROCORR2005, Lisboa, Portugal September, 2005.
- Poznyak, S.K., Zheludkevich, M.L., Kulak, A.I., Ferreira, M.G.S., "Anodic films prepared on titanium by high-voltage powerful discharge in electrolyte" European Corrosion Congress - EUROCORR2005, Lisboa, Portugal September, 2005.
- Cecilio, P., Duarte, R., Simões, A.M., Ferreira, M.G.S., Montemor, M.F.; "An XPS and SVET study on the effect of cerium nitrate on the corrosion behaviour of galvanised steel", European Corrosion Congress - EUROCORR2005, Lisboa, Portugal, September, 2005.
- Fernandes, J.C.S., Picciochi, R., Ferreira, M.G.S., "EIS Studies on Aluminium Anodised by Sulphuric Acid and Sulphuric-Boric Acid Processes", European Corrosion Congress - EUROCORR2005, Lisboa, Portugal, September, 2005.
- Simões, A.M.P., Bastos, A.C., Montemor, M.F.; "An XPS study on the effect of chromate pigment extract on zinc and iron substrates", European Corrosion Congress - EUROCORR2005, Lisboa, Portugal, September, 2005.
- Cecilio, P., Duarte, R., Simões, A.M., Ferreira, M.G.S., Montemor, M.F.; "SVET and XPS assessment of the corrosion behaviour of galvanised steel substrates in the presence of cerium nitrate", International Corrosion Congress - 16th ICC, Beijing, China, September, 2005.
- Montemor, M.F., Trabelsi, W., Triki, E., Zheludkevich, M., Ferreira, M.G.S., "New pre-treatments for galvanized steel substrates based on doped organosilane solutions" International Corrosion Congress - 16th ICC, Beijing, China, September, 2005.
- Montemor, M.F., Alves, H., Matos, J., Simões, A. M., Fernandes J.C.S., Lourenço, Z., Costa, A.S., Appleton, A.J., Ferreira, M.G., "Monitoring of the chloride content in reinforced concrete structures using a Ag/AgCl -based sensor. Laboratory and field tests", International Corrosion Congress - 16th ICC, Beijing, China, September, 2005.
- Fernandes, J.C.S., Picciochi, R., Ferreira, M.G.S., "EIS Studies on Aluminium Anodised by Sulphuric Acid and Sulphuric-Boric Acid Processes", International Corrosion Congress - 16th ICC, Beijing, China, September, 2005.
- Serra, R., Zheludkevich, M. L., Grundmeier, G., Ferreira, M. G. S., "Influence of microwave plasma polymerization of coil coated substrates on the barrier properties of the final coating system", Materials2005, III International Materials Symposium, Aveiro, Portugal, 23 March, 2005.
- Mota, A.F., Silvestre, A.J., Sousa, P.M., Conde, O., Rosa, M.A., Godinho, M., "CVD of CrO₂ thin films: influence of the deposition parameters on their structural and magnetic properties", III Intern. Mater. Symp., Aveiro, Portugal, 2005.
- Prudêncio, L.M., Paramês, L., Conde, O., da Silva, R.C., "Ti surface modification by Cr implantation I: formation of intermetallic layers phase", III Intern. Mater. Symp., Aveiro, Portugal, 2005.
- Branford, W., Magnus, F., Liu, Y.L., Khare, N., Wei, M., Driscoll, J.M., Paramês, M.L., Popovici, N., Jimenez, E., Conde, O., Morrison, K., Miyoshi, Y., Clowes, S., Bugoslavsky, Y., Cohen, L., "Magnetotransport properties of magnetic oxides", 2005 Am. Phys. Soc. March Meeting, Session R1, Los Angeles, CA, USA, 2005.
- Paramês, M.L., Mariano, J., Viskadourakis, Z., Popovici, N., Rogalski, M.S., Giapintzakis, J., Conde, O., "Structure and magnetic properties of low-temperature PLD magnetite thin films", European Mater. Res. Soc. Spring Meeting, EMRS'05, Symp. B, Strasbourg, F, 2005.
- Paramês, M.L., Mariano, J., Viskadourakis, Z., Popovici, N., Rogalski, M.S., Giapintzakis, J., Conde, O., "PLD of Fe₃O₄ thin films: influence of background gas on surface morphology and magnetic properties", European Mater. Res. Soc. Spring Meeting, EMRS'05, Symp. J, Strasbourg, F, 2005.
- Conde, O., Paramês, M.L., Silvestre, A.J., Popovici, N., Sousa, P.M., "Laser processing of magnetic oxides for applications in spintronics", European Mater. Res. Soc. Spring Meeting, EMRS'05, Symp. J, Strasbourg, F, 2005.
- Sousa, P.M., Silvestre, A.J., Conde, O., "UV laser-assisted CVD of CrO₂/Cr₂O₃ on (0001) Al₂O₃ substrates", European Congress on Advanced Materials and Processes, Euromat 2005, Symp. D6, Prague, Cz, 2005.
- Popovici, N., Jimenez, E., da Silva, R.C., Branford, W.R., Cohen, L.F., Conde, O., "Optical and magnetic properties of Co-doped TiO₂ thin films grown by pulsed laser deposition", 21st Intern. Conf. on Amorphous and Nanocrystalline Semiconductors, ICANS 21, Lisboa, Portugal, 2005.
- Cerqueira, M.F., Losurdo, M., Stepihova, M., Monteiro, T., Alves, E., Conde, O., "Study of the oxygen role in the photoluminescence of erbium doped silicon quantum dots embedded in a silicon amorphous matrix", 21st Intern. Conf. on Amorphous and Nanocrystalline Semiconductors, ICANS 21, Lisboa, Portugal, 2005.
- Chahboun, A., Rolo, A.G., Conde, O., Vasilevskiy, M.I., Gomes, M.J.M., "Photoluminescence of Ge nanocrystals embedded in SiO₂", 5th Iberian Vacuum Meeting - RIVA 5, Guimarães, Portugal, 2005.
- Cerqueira, M.F., Rolo, A.G., Stepihova, M., Vasilevskiy, M.I., Conde, O., Alves, E., Andres, G., "Erbium doped nanocrystalline silicon thin films: structural characterization and optical studies", 1st Intern. Workshop on Semiconductor Nanocrystals, SEMINANO 2005, Budapest, H, 2005.
- Dias, D., Carvalho, P.A., Ferro, A. C., Monteiro, R., Lohwasser, W., "ESR improvement of Ta Capacitors by optimisation of MnO₂ Pyrolysis Profile", CARTS EUROPE 2005, the 19th Annual Passive Components Conference, Prague, Check Republic, October, 2005, Proceedings of

Guedes, M., Ferro, A. C., Ferreira, J. M. F., "Effect of TIRON® on the Stabilization of CuO and Cu₂O Aqueous Suspension", EUROMAT2005 - European Congress on Advanced Materials and Processes, Prague, Czech Republic, September, 2005.

Dias, D., Carvalho, P. A., Ferro, A. C., Lohwasser, W., "Thermal decomposition of Mn(NO₃)₂ for lower ESR Ta Capacitors", EUROMAT2005 - European Congress on Advanced Materials and Processes, Prague, Czech Republic, September, 2005.

Dias, D., Carvalho, P. A., Ferro, A. C., Monteiro, R., Lohwasser, W., "Semiconducting Pyrolytic MnO₂: microstructure and conductivity" ICANS21 - 21st International Conference on Amorphous and Nanocrystalline Semiconductors, Lisboa, Portugal, September, 2005.

Dias, D., Carvalho, P. A., Ferro, A. C., Lohwasser, W., "TEM Investigation of Counter-Electrode Structure in Ta Capacitors", Microscopy & Microanalysis 2005 - 19th International Congress on Microscopy, Honolulu, Hawaii, USA, August, 2005.

Guedes, M., Ferro, A. C., Ferreira, J.M.F, "Stabilisation of CuO aqueous Suspensions", Materias2005, 3rd International Materials Symposium, Aveiro, Portugal, March, 2005.

Dias, D., Carvalho, P. A., Ferro, A. C., Lohwasser, W., "ESR improvement in Tantalum Capacitors using MnO₂ as Counter-Electrode", Materias2005, 3rd International Materials Symposium, Aveiro, Portugal, March, 2005.

Reis, N., Ferro, A. C., Pereira, J. C., "Geometry and Topology of Random and Weighted Voronoi Partitions of Space", Materias2005, 3rd International Materials Symposium, Aveiro, Portugal, March, 2005.

- In national meetings

Almeida, A., Carvalho, P. A., Vilar, R., "Study of Laser Developed Al-Cr Surface Alloys: Microstructure, Mechanical and Wear Behaviour", Microscopy in Motion, XLth Meeting of the Portuguese Society for Microscopy and Cell Biology (SPME-BC), Lisboa, 8-10 December, 2005.

Sivakumar, M., Oliveira, V., Vilar, R., "SEM Characterisation of KrF Excimer Laser Processed Dentin, Microscopy in Motion", XLth Meeting of the Portuguese Society for Microscopy and Cell Biology (SPME-BC), Lisboa, 8-10 December, 2005.

Colaço, R., Graça, S., Vilar, R., "Using atomic force microscopes for nanotribological studies", XLth Meeting of the Portuguese Society for Microscopy and Cell Biology (SPME-BC), Lisboa, 8-10 December, 2005.

Dias, M., Carvalho, P. A., Dias, A.P., Solobug, O., Tougaif, D., Noel, H., Gonçalves, A.P., XLth Meeting of the Portuguese Society for Microscopy and Cell Biology (SPME-BC), Lisboa, 8-10 December 2005.

Dias, D., Carvalho, P. A., Ferro, A. C., "MnO₂ structure in Ta capacitors", XLth Meeting of the Portuguese Society for Microscopy and Cell Biology (SPME-BC), Lisboa, 8-10 December, 2005.

Marques, M. T., Correia, J. B., Carvalho, P. A., "A rapid method to prepare powder samples for TEM/SEM", XLth Meeting of the Portuguese Society for Microscopy and Cell Biology (SPME-BC), Lisboa, 8-10 December, 2005.

Nogueira, I.D., Carvalho, P. A., Vilar, R., "Complex stacking faults in hexagonal ordered systems", XLth Meeting of the Portuguese Society for Microscopy and Cell Biology (SPME-BC), Lisboa, 8-10 December, 2005.

Eugénio, S., Vilar, R., "KrF laser treatment of human dentin: a surface morphology study", XLth Meeting of the Portuguese Society for Microscopy and Cell Biology (SPME-BC), Lisboa, 8-10 December, 2005.

Carvalho, P. A., De Hosson, J.Th.M, Fonseca, I., Gonçalves, A.P., Vilar, R., "Magnetic domain configuration in Y-Fe-Mo and Y-Fe-Ti splat-quenched alloys", XLth Meeting of the Portuguese Society for Microscopy and Cell Biology (SPME-BC), Lisboa, 8-10 December, 2005.

Paramês, M.L., Viskadourakis, Z., Mariano, J., Popovici, N., Rogalski, M.S., Giapintzakis, J., Conde, O., "Pulsed laser deposition of magnetite thin films", Fisica 2005 - Fisica para o Sec. XXI, Porto, P, 2005.

C - Technical reports

Fagerholm, H., Rosqvist, A., Peltola, A., Hornstrom, S.E., Bergman, T., Albers, A., Lewus, M., Ferreira, M.G, Montemor, M.F., Schinking, B., ECSC Steel RTD Program "Multifunctional passivation methods for hot dip galvanised steel" (project nº ECSC 7210-PR382) Technical report nº 6, June, 2005.

Grundmeier, G., Klüppel, I., Schinking, B., Lamaka, S., Zheludkevich, M., Ferreira, M., Montemor, F., Raab, A.E., Till, E., Serra, M.G., RFCS RTD Program "Formability and Self-Repair Properties of Advanced Weldable Primers (PrimeForm)" (Project nº RFS-CR-04031) Technical report nº 2, June, 2005.

Fagerholm, H., Rosqvist, A., Peltola, A., Hornstrom, S.E., Bergman, T., Albers, A., Lewus, M., Ferreira, M.G, Montemor, M.F., Schinking, B., ECSC Steel RTD Program "Multifunctional passivation methods for hot dip galvanised steel" (project nº ECSC 7210-PR382) Final report, December, 2005.

Grundmeier, G., Klüppel, I., Schinking, B., Lamaka, S., Zheludkevich, M., Ferreira, M., Montemor, F., Raab, A.E., Till, E., Serra, M.G., RFCS RTD Program "Formability and Self-Repair Properties of Advanced Weldable Primers (PrimeForm)" (Project nº RFS-CR-04031) Technical report nº 3, December, 2005.

Ferreira, M. G. S., Matthieu, A., Augustsson, P., Thierry, D., Friberg, S., ECSC Steel RTD Program, "Prediction of Durability Performance of Coil-Coated Steel used in the Building Industry of Climatic Parameters on Corrosion Properties of Coil-Coated Materials" (Project ECSC nº 7210-PR321), Final Report, March, 2005.

Grundmeier, G., Yang, L., Saemann, N., Strauß, B., Linder, B., Valle, R., English, T., Hammond, D. B., Ferreira, M.G.S., Zheludkevich, M., ECSC Steel RTD Program "Tailored Thin Plasma Polymers for Surface Engineering of Coil Coated Steel" (project nº ECSC 7210-PR/383) Final report nº 6, July, 2005.

Arit, N., Gumpel, P., Kreinbohm, R., Schiller, D., Matress, V., Cristofaro, N., Telegdi, J., Moura e Silva, T., Ferreira, M., ECSC Steel RTD Program "Expanding the Durability of Stainless Steels in Water Systems Under microbiological Corrosion Conditions" (project nº ECSC 7210-PR/362) Technical Report nº 6, June, 2005.

3rd Year Progress Report of POCTI/CTM/41413/2001 Project "Laser-driven synthesis of ferromagnetic oxides for spin electronics".

Final Report of E.U. GROWTH Project FENIKS: "Ferromagnetic semiconductors and novel magnetic-semiconductor heterostructures for

Improved knowledge on spintronics* (contract no. G5RD-CT-2001-00535).

Six month Progress Report of POCT/CTM/57019/2004 Project "Synthesis of room temperature diluted magnetic semiconductors by low temperature deposition methods".

D - Meetings organization

- Organization of national or international conferences

XLth meeting of the Portuguese Society for Microscopy and Cell Biology (SPME-BC), Faculdade de Medicina Dentária da Universidade de Lisboa, Lisbon, 8 - 9 December 2005.

School on New Methods in Microscopy, Sociedade portuguesa de Microscopia Electrónica e Biologia Celular, Faculdade de Medicina Dentária da Universidade de Lisboa, Lisbon, 10 December 2005.

Internacional Workshop Cryo Methods in Analytical Electron Microscopy, Instituto Superior Técnico e Instituto Português de Oncologia, no âmbito da actividade da Sociedade Portuguesa de Microscopia Electrónica, 31 May - 3 June de 2005.

R.M. Almeida was co-organizer, together with Prof. Dunbar P. Birnie III, of a Special Session on Sol-Gel Science and Technology, at the 107th Annual Meeting of the American Ceramic Society, Baltimore (MD, USA), April 10-13, 2005.

- Member of conferences scientific committees

R.M. Almeida, Member of Scientific Committee of Photoluminescence in Rare-earths: Photonic Materials and Devices, Trento (Italy), May 2-3, 2005.

R.M. Almeida, Member of Advisory Board of 17th University Conference on Glass Science, State College (PA, USA), June 25-29, 2005.

R.M. Almeida, Member of International Advisory Board of 13th International Workshop on Sol-Gel Science and Technology, UCLA, Los Angeles (CA, USA), August 21-26, 2005.

Members of the Local Organizing Committee of the "European Corrosion Congress - EUROCORR 2005", to be held in Lisbon, Portugal (September 2005)

Ferreira M.G.S. (Chairman)

Montemor M.F.

Fernandes J.C.S.

Simões A.M.P.

Carnezim M.J.

Moura e Silva M.T.

Cunha Belo M.

Castela A.L. S.

Fernandes, J.C.S.: Member of the International Scientific Committee of CORROSION 2005 - International Conference "Science and Economy", Warsaw, Poland (June 2005)

E - Advanced training

- PhD Thesis

Amélia Almeida, Desenvolvimento de ligas alumínio-metal de transição por síntese assistida por laser, Instituto Superior Técnico, Concluded in 2005, Supervisor: Rui Vilar.

Arnando Fernandes, Detecção de incêndios florestais por retrodifusão de radiação laser, Instituto Superior Técnico, Concluded in 2005, Supervisor: Rui Vilar.

Ana C. Marques, "Erbium/silver glass matrix nanocomposites by sol-gel processing, for integrated optics", IST, Lisboa, approved on December 15, 2005, Supervisor: Rui Almeida.

António Alexandre da Cunha Bastos, "Estudo electroquímico do efeito da deformação mecânica no desempenho anti-corrosivo da banada pré-pintada" Finished July 2005, Supervisor: Alda M.P. Simões.

Pedro Sanguino "Growth of Gallium Nitride with the Cyclic Pulsed Laser Deposition System" concluded in October 2005, supervisor: Reinhard Schwarz.

Manfred Niehus "Disorder related optical properties and electronic transport in Gallium nitride", concluded in September 2005, Supervisor: Reinhard Schwarz.

José Lino da Costa, Aplicação da deposição assistida por laser ao fabrico de protótipos, Instituto Superior Técnico (Ongoing - to be concluded in 2006) (Supervisor: Vilar, R.).

Manickam Sivakumar, Laser Surface Processing for Odontological Applications, Instituto Superior Técnico (Ongoing - started in June 2002) (Supervisor: Vilar, R.).

Maria Teresa Marques, Estrutura - propriedades de nanocompósitos à base de cobre produzidos por mecanosíntese, Instituto Superior Técnico (co-oriented by Dr. José Brito Correia, NETI) (Ongoing -started in June 2002) (Supervisor: Vilar, R.).

Christopher Meacock, Laser-Assisted Design of Titanium Alloys for Dental Prosthesis, Instituto Superior Técnico (Ongoing - started in March 2004) (Supervisor: Vilar, R.).

R. Anand Kumar, Rapid Tooling by Laser Powder Deposition of Aluminium Matrix Composites, Instituto Superior Técnico (Ongoing - started in June 2004) (Supervisor: Vilar, R.).

António Sérgio Crespo, Aplicação da deposição assistida por laser à manufactura de próteses e implantes metálicos, Instituto Superior Técnico (Ongoing - started in September 2004) (Supervisor: Vilar, R.).

Sérgio Grãça, Tribology of Ni-Co alloys: from micro to nanoscale, Instituto Superior Técnico (Ongoing - Started in October 2004) (Supervisor: Colaço, R.)

José F. M. L. Mariano, Ressonância Nuclear em Filmes Finos Magnéticos (Ongoing - Started in July 2004) (Supervisor: M. S. Rogalski).

Marta Sofia Rosado Silva Dias, Boretos Intermetálicos ternários, Instituto Superior Técnico (co-supervisor: Dr. António Gonçalves, ITN) (Ongoing - started in September 2005) (supervisor: Carvalho, P. A.)

Raquel Alexandra Galamba Duarte, ongoing, Supervisor: Ferreira, M.G.S.

Ana Maria Mateus Cabral, on-going, Supervisor: Ferreira, M.G.S.

Ricardo Gil Henriques Serra, ongoing, Supervisor: Ferreira, M.G.S.

Kiryl Yasakau, ongoing, Supervisor: Ferreira, M.G.S.

Pedro M. Sousa: "Síntese de filmes finos de óxido de cromo por LCVD (Laser-assisted CVD) e caracterização" - FCUL (ongoing)

Nicoleta Popovici: "Filmes finos de óxidos funcionais para aplicações em spintrónica. Crescimento e caracterização" - FCUL (ongoing)

Décio Dias - Tantalum Capacitors with low ESR values
Supervisor Ferro, A. C. (started December 2001)

Ana Mafalda Guedes - Novel Reaction Infiltration Process for Aluminium Alloy Matrix Composites
Supervisor Ferro, A. C. (started September 2002)

- Master Thesis

Daniela da Silva Nunes, Magnetic domains in Y-Fe-Mo, Y-Fe-Ti, Nd-Fe-Ti and Nd-Fe-Mo alloys (Ongoing - started in December 2005) (Supervisor: Carvalho, P. A.)

G - Computer Applications

Computer Program:

GAMGI, General Atomistic Modelling Graphic Interface,

Most recent release: GAMGI 0.11.5

Website: <http://www.gamgi.org/>

GAMGI Website: <http://www.gamgi.org/>

H - Pilot Installations

The Atomic Force Microscopy Laboratory (AFMLab) was installed during 2005 in room 01.5.6 of Ciência building in the IST campus, under the supervision of the Materials Design and Processing Group. Beside the usual contact and tapping modes for topographic visualisation, the equipment enables for scanning tunneling microscopy (STM), force spectroscopy, nanolithography manipulation, magnetic and electrical force measurements and liquid cell microscopy.

Others

- Member of editorial advisory board of international journals:

Vilar, R. is a member of the editorial advisory boards of:

-Lasers in Engineering", Old City Publishing Inc., New York;

-International Journal of Materials and Product Technology (IJMPT), Inderscience Publishers, Switzerland;

-Revista da Escola de Minas", Ouro Preto, Brasil;

-Materials Science Foundations Series, TransTech Publications;

-Revista de Metalurgia (Madrid), CSIC-CENIM, Madrid.

Montemor, M.F.: Member of the Technical Group TGS n.º 5 "Finishing and Coating" for the Monitoring of R&D projects of the Research Fund for Coal and Steel (RFCS) and for the running projects of the European Community for Coal and Steel (ECSC) - European Commission, RESEARCH DIRECTORATE-GENERAL, Direction G - Industrial Technologies.

Montemor, M.F. - Member of the Editorial Board of the Journal "Cement and Concrete Composites", pub Elsevier.

Simões, A.M.P.: member of the editorial board of Corrosão e Protecção de Materiais (INETI, Portugal)

Ferreira, M.G.S. - Member of the Editorial Board of the following Journals:

- Materials and Corrosion/Werkstoffe und Korrosion.

- Journal of Corrosion Science & Engineering

- Corrosion Reviews

- Revista de Corrosão e Protecção dos Materiais

- Portugaliae Electrochimica Acta

- Journal of the Corrosion Science Society of Korea

- Reviewing of papers in international scientific journals

Vilar, R. is referee of the following international journals:

-Applied Surface Science;

-Journal of Applied Physics;

-Boletín de la Sociedad Española de Cerámica y Vidrio;

-Journal of Laser Applications;

- Journal of Manufacturing Science and Engineering;
- Journal of Materials Science;
- Journal of Physics: Condensed Matter;
- Lasers and Optoelectronics;
- Lasers in Engineering;
- Materials Research Bulletin;
- Materials Science Forum;
- Measurement Science and Technology;
- Nuclear Instruments and Methods B: Beam Interactions with Materials and Atoms;
- Revista da Escola de Minas (Brasil);
- Revista de Metalurgia (CENIM, Madrid);
- Surface and Coatings Technology;
- Wear

M. S. Rogalski is referee of the following international journals:

- Journal of Physics C: Condensed Matter
- Journal of Physics D: Applied Physics

P. Carvalho is referee of the following international journals:

- Philosophical Magazine;
- Materials Science Forum.

Colaço, R. is referee of the following international journals:

- Wear;
- Tribology Letters;
- Materials Science and Engineering;
- Surface and Coatings Technology;
- Journal of Materials Science;
- Materials Science Forum.

A. M. Deus is referee of the following international journals:

- Metallurgical and Materials Transactions B;
- Applied Physics A.

Almeida, A. is referee of the following international journals:

- Materials Science Forum;
- Surface and Coatings Technology;
- Journal of Laser Applications;
- Journal of Materials Science.

R.M. Almeida is a member of the Advisory Editorial Boards of: Journal of Non-Crystalline Solids, Journal of Sol-Gel Science and Technology and Key Engineering Materials.

R.M. Almeida was a reviewer for several papers in: J. Non-Crystalline Solids, J. Sol-Gel Sci. Technology, J. Amer. Ceramic Society, Applied Physics Letters, Physica Status Solidi, Chemistry of Materials, Materials Science and Engineering B and Thin Solid Films.

L.F. Santos was a reviewer for J. Non-Crystalline Solids.

M.C. Gonçalves was a reviewer for J. Non-Crystalline Solids.

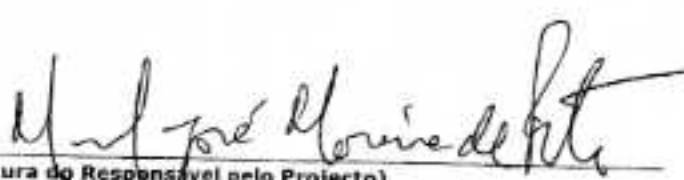
Olinda Conde was a reviewer for the following journals: Surface Coatings and Technology, Optical Materials and Journal of Non-crystalline Solids.

António J. Silvestre was a reviewer for the Journal of Crystal Growth.

- Awards

R.M. Almeida was a recipient of the Award "Stimulus to Excellence" ("Estímulo à Excelência"), given by FCT for a period of two years, as a reward for having published over 100 papers in international scientific journals included in ISI's Science Citation Index, with over 500 hundred citations by independent publications.

Data: sexta-feira, 5 de Maio de 2006


(assinatura do Responsável pelo Projecto)

05-05-2006 - 11:15

 UNIÃO EUROPEIA - Fundos Estruturais

 Governo da República Portuguesa

 Ciência e Inovação - Programa Operacional Ciência e Inovação 2010

Instituto de Ciência e Engenharia de Materiais e Superfícies (Lisboa) - ICEMS (B4)

[[Página principal](#) > [Relatório científico 2005](#)]**Sub-projecto****Sub-project**

Structural Materials: processing, analysis and modelling

Investigador responsável**Project leader**

Luis Manuel Guerra Silva Rosa

Resumo da actividade desenvolvida

The synopsis of the research work developed during 2005, according to the different tasks, is the following:

1. Cellular materials:

- Liquid foams: problems related to the energy of 2D foam clusters; instabilities in 2D and 3D bubble clusters; shapes of liquid films; tensile testing of 3D foams using the Wilhelmy balance to obtain force-displacement curves; effect of Plateau borders (triple film junctions) on the equilibrium and rheology of 2D and 3D foams.
- Methodologies for cork quality evaluation; studies on permeability of cork and plastic stoppers to gases.
- One R&D project with external financing has started in March 2005.

2. Multiphase polymeric systems and biopolymers:

- Studies on dental restorative materials, particularly, on photo-curable comonomer mixtures loaded with a silane treated filler; observations of the influence of the presence of water on ¹H MAS spectra of composite resins, which provided a novel route to study the resin-filler interfacial water uptake and the plasticizer effect of water.
- Solid state ¹³C-NMR studies on the crystalline structure of isotropic and oriented polyamides (polyamide 6 and polyamide 12) which, in combination with Synchrotron WAXS and SAXS observations, provided information about the resulting changes in the fine crystalline structure following the processing of these semi-crystalline polymers.
- Research on hydration of Portland cement (Type I) pastes as a function of particle size: the results demonstrated that using ¹H STRAFI-MRI it is possible to identify different stages during early hydration and hardening processes of cements and that the duration of these periods depend on the particle size of the solid component. The presence of iron paramagnetic centres and strong magnetic susceptibility inhomogeneities make the observation of this material extremely difficult by conventional MRI techniques.
- Seven R&D projects with external financing were in progress during 2005.

3. Ceramic materials and composites:

- Ornamental stones (natural ceramics): studies on rock fracture mechanics and stone cutting technologies; mineral composition, microstructure and mechanical properties; dynamic test methodologies for assessing the elastic constants; characterisation of diamond tools (wear behaviour and mechanical properties); study of new stone processing technologies using high-performance diamond tools; optimisation of polishing processes; research into the use of new inspection techniques for assessing stone surface quality and study of new diamond tools for polishing stones.
- Ceramic materials: characterization methods for ceramic (SiC, Al₂O₃) and carbon fibres used to reinforce ceramic matrix and carbon-carbon composites; tensile test methods for characterising reinforcements (multifilament tows consisting of small-diameter SiC, Al₂O₃ and carbon fibres) and test methods to determine the fiber/matrix interfacial frictional shear stress (using minicomposites); evaluation of damage in composites through cyclic tensile tests; development of statistical models for the distribution of strength data; processing and characterisation studies of cordierite (dense cordierite and cordierite foams) including preliminary attempts to sinter cordierite using direct solar radiation; carbide synthesis of d-group transition metals and kinetic aspects of reaction under the solar spectral radiation. A research proposal (submitted in December 2004) for granting access to the SOLFACE facilities at PROMES-CNRS, Odeillo, France, was approved by the Solface Selection Panel and carried out during the summer of 2005.
- Two E.U. funded R&D projects were in progress during 2005.

4. Fatigue of materials and composite materials:

- Metallic materials: studies on cyclic plasticity and fatigue behaviour of metallic materials under dynamic multiaxial loading; new experiments of low cycle fatigue tests under various biaxial tension and torsion loading paths; simulation of the elasto-plastic behaviour using finite element technique; development of improved parameters for multiaxial fatigue life prediction.
- Laminated composite materials: study of mixed mode fracture analysis of laminated composite materials; design of new testing apparatus and basic tests concerning single mode or mixed mode fracture.

5. Fatigue and fracture of engineering materials and structures:

Four research projects were in progress during 2005:

- "Surface integrity for fatigue life extension" (RTO/NATO, Project 131)
- "Fatigue design of exhaust conducts of naval gas turbines" (Portuguese Navy)
- Fatigue and creep behaviour of powder metallurgy nickel base superalloys, (FCT, POCT1/EME/46195/02)
- Reliability and fatigue design of railway components.

Indicadores de execução 2005**A - Publicações**

Livros

Previsto:**Realizado**

2

4

Artigos em revistas internacionais

18

19

Artigos em revistas nacionais

2

1

B - Comunicações

Em congressos científicos internacionais

25

45

Em congressos científicos nacionais

20

9

C - Relatórios

0

7

D - Organização de seminários e conferências

1

1

E - Formação Avançada

Teses de Doutoramento

2

2

Teses de Mestrado

2

1

Outra

0

0

F - Modelos

0

0

G - Aplicações computacionais

0

0

| | | |
|------------------------------|---|---|
| H - Instalações Piloto | 0 | 0 |
| I - Protótipos laboratoriais | 0 | 1 |
| J - Patentes | 0 | 6 |

Publicações em 2005

A - Publications

- Papers in international journals

Guerra Rosa, L., Amáral, P.M., Fernandes, J.C., "Experimental evaluation of Dynamic Test Methodologies for assessing the Elastic Constants of Granitic Rocks", *Journal of Nondestructive Evaluation*, 24 (4): 135-142, 2005.

Oliveira, F. A. C., Shohoji, N., Fernandes, J.C., Guerra Rosa, L., "Solar sintering of cordierite-based ceramics at low temperatures", *Solar Energy Journal*, 78 (3): 351-361, 2005.

Vaz, M. F., Fortes, M. A., Teixeira, P. I. C., "Symmetry-breaking transitions in the dissociation of two-dimensional Plateau borders", *European Physical Journal E* 16, 401-407, 2005.

Teixeira, P. I. C., Fortes, M. A., "Wet two-dimensional bubble clusters: liquid partitioning and energy", *Journal of Physics: Condensed Matter* 17, 2327-2339, 2005.

Fortes, M. A., Vaz, M. F., Teixeira, P. I. C., "Topological and geometrical transitions in two-dimensional Plateau borders under gravity", *Philosophical Magazine* 85, 1291-1302, 2005.

Teixeira, P. I. C., Fortes, M. A., "Decorated Plateau borders in two-dimensional liquid foams: geometry and excess energy", *Philosophical Magazine* 85, 1303-1322, 2005.

Fortes, M. A., Teixeira, P. I. C., "Excess energy of a Plateau border at a wall", *Philosophical Magazine Letters* 85, 21-25, 2005.

Vaz, M. F., Cox, S. J., "Two-bubble instabilities in quasi-two-dimensional foams", *Philosophical Magazine Letters* 85, 415-425, 2005.

Fortes, M. A., Teixeira, P. I. C., "Triple-line decoration and line tension in simple three-dimensional foam clusters", *Physical Review E* 71, 051404, 2005.

Fortes, M. A., Teixeira, P. I. C., Vaz, M. Fátima, "Erratum: Distribution of film orientation in free and strained foams", *Physical Review Letters* 94, 10, 109902 2005.

Reis, L., Li, B., Leite, M., Freitas, M. de, "Effects of non-proportional loading paths on the orientation of fatigue crack path", *Fatigue and Fracture of Engineering Materials and Structures*, vol. 28, 445-454, 2005.

Nunes, T.G., Ceballos, L., Osorio, R., Toledano, M., "Spatially-Resolved Photopolymerization Kinetics and Oxygen Inhibition in Dental Adhesives", *Biomaterials*, 26 (14), 1809-1817, 2005.

Pereira, S.G., Osorio, R., Toledano, M., Nunes, T.G., "Evaluation of two Bis-GMA analogues as potential monomer diluents to improve the mechanical properties of light-cured composite resins", *Dental Materials*, 21, 823, 2005.

Dencheva, N., Nunes, T., Oliveira, M.J., Denchev, Z., "Microfibrillar Composites Based on Polyamide/Polyethylene Blends: 1. Structure Investigations in Oriented and Isotropic Polyamide 6", *Polymer*, 46, 887-901, 2005.

Pereira, S.G., Reis, N., Nunes, T.G., "Spatially resolved studies on the photopolymerization of dimethacrylate monomers", *Polymer*, 46, 8034, 2005.

Dencheva, N., Nunes, T.G., Oliveira, M.J., Denchev, Z., "Crystalline Structure of Polyamide 12 as Revealed by Solid state ¹³C NMR and Synchrotron WAXS and SAXS", *J. Polym. Sci. Part B: Polym. Phys.*, 43, 3720-3733, 2005.

Reis, N., Ainsley, C., Derby, B., "Viscosity and acoustic behaviour of ceramic suspensions optimized for phase-change ink-jet printing", *Journal of the American Ceramic Society*, 88(4): 802-808, 2005.

Reis, N., Ainsley, C., Derby, B., "Ink-jet delivery of particle suspensions by piezoelectric droplet ejectors", *Journal of Applied Physics*, 97 (9): 094903 (1-6), 2005.

Dearden, A. L., Smith, P. J., Shin, D-Y, Reis, N., Derby, B., O'Brien, P., "A low curing temperature silver ink for use in ink-jet printing and subsequent production of conductive tracks", *Macromolecular Rapid Communications*, 26, 315-318, 2005.

- Papers in national journals

Anjinho, C.A., Amáral, P.M., Fernandes, J.C., Guerra Rosa, L., "Análise de ferramentas diamantadas utilizadas no processo de desbaste de um granito português", *Rochas & Equipamentos*, 77 (XX): 110-119, 2005.

- Books and chapters of books

Amáral, P.M., Fernandes, J.C., "Rochas Ornamentais", Capítulo 6, in "Materiais de Construção - Guia de Utilização", edited by Loja da Imagem / Arquitectura e Vida, Lisboa, ISBN 972-98882-3-X, pp. 130-158, 2005.

Arlindo Silva, Carlos Tavares Ribeiro, João Dias, e Luis Sousa, *Desenho Técnico Moderno*. LIDEL Edições Técnicas, 5ª Edição. Setembro 2005, ISBN 9727573371.

Branco, C.M., Costa, J.D., Ferreira, J.A., Ribeiro A.A., "Design of Machine Components (in portuguese) ed. Calouste Gulbenkian Foundation, Lisbon, 850 pages, 1000 copies, June 2005.

Diogo, A. C., "Polímeros", in "Materiais de Construção - Guia de Utilização", Loja da Imagem, Lisboa, 212-244, 2005.

B - Communications

- In international meetings

Amaral, P.M, Poço, D., Pinto, S., Fernandes, J.C., Guerra Rosa, L., "A standard test method to characterise diamond tools used in the construction field", Proc. 1st International Industrial Diamond Conference, Barcelona, Spain, (edited by Diamond At Work Ltd.) ISSN 1749-1045, Vol. 1, p.19, 20-21 October 2005.

Amaral, P.M, Fernandes, J.C., Guerra Rosa, L., "A comparison between X-ray diffraction and petrography techniques used to determine the mineralogical composition of granite and comparable hard rocks", Proc. MATERIALS 2005, III International Materials Symposium, Aveiro, Portugal, p. 341, 20-23 March 2005.

Guerra Rosa, L., Amaral, P.M, Pinto, S., Fernandes, J.C., "Assessment of Young's moduli of metallic materials using two different methodologies: monotonic loading and dynamic excitation", Proc. MATERIALS 2005, III International Materials Symposium, Aveiro, Portugal, p.157, 20-23 March 2005.

Guerra Rosa, L., Colella, A., Anjinho, C.A., "Effect of paraffin oil used as a lubricant in tensile tests of carbon fibre bundles", Proc. MATERIALS 2005, III International Materials Symposium 2005, Aveiro, Portugal, p.33, 20-23 March 2005.

Oliveira, F., Fernandes, J.C., Dias, D., Tavares, S., Domingues, J., "Optimisation cordierite processing through Taguchi method", Proc. MATERIALS 2005, III International Materials Symposium Aveiro, Portugal, p.311, 20-23 March 2005.

Oliveira, F., Fernandes, J.C., Dias, D., Delmas, F., Araújo, A., "Incorporation of aluminium residues in dense cordierite formulations", Proc. MATERIALS 2005, III International Materials Symposium, Aveiro, Portugal, p.361, 20-23 March 2005.

Oliveira, F., Fernandes, J.C., Dias, S., "Thermal shock behaviour of open-cell cordierite foams", Proc. MATERIALS 2005, III International Materials Symposium, Aveiro, Portugal, p.158, 20-23 March 2005.

Carvalho, A. P., Vaz, M. Fátima, Samora, M. J. and Pires, J., "Characterisation of ceramic tiles", III international Materials Symposium, Aveiro-Portugal, March 2005.

Fortes, M. Amaral, Rosa, M. Emília, "Dimensional recovery of used cork stoppers", M. Amaral Fortes e M. Emília Rosa, III International Materials Symposium, Aveiro-Portugal, March 2005.

Rosa, M. Emília, Fortes, M. A., Piloto, Lurdes, "The evaluation of cork quality by penetration tests", III International Materials Symposium, Aveiro-Portugal, March 2005.

Vaz, M. Fátima, Fortes, M. A., "Impurity size effects in the topology of solid solutions", III International Materials Symposium, Aveiro-Portugal, March 2005.

Vaz, M. Fátima, Fortes, M. A., Teixeira, P. I. C., "Transitions in Plateau borders", Workshop on Foam Rheology in Two Dimensions (FRIT), University of Wales, Aberystwyth-UK, June 2005.

Vaz, M. Fátima, Cox, S. J., "Topological instabilities of deformed bubble clusters", Workshop on Foam Rheology in Two Dimensions (FRIT), University of Wales, Aberystwyth-UK, June 2005.

Teixeira, P. I. C. and Fortes, M. A., "Line tension in three-dimensional foams", 6th Liquid Matter Conference, Utrecht-The Netherlands, July 2005.

Bento, M. Filomena, Pereira, Helena, Cunha, M. Áurea, "Air permeation through several different cellular materials", RIVA 5 - 5th Iberian Vacuum Meeting, Guimarães-Portugal, September 2005.

Anjos, Ofélia, Pereira, Helena, Rosa, M. Emília, "Variation of compression and tensile properties of cork", Suberwood 2005-New challenges for the integration of cork oak forests and products, Huelva-Spain, October 2005.

Pereira, C. Silva, Basilio, M. C., Gaspar, R., Rosa, M. Emília, Pereira, H., San-Romão, M. V., "Fungal colonisation of cork - brief analysis of some inter-dependent facts", Suberwood 2005-New challenges for the integration of cork oak forests and products, Huelva-Spain, October 2005.

Rosa, M. Emília, Fortes, M. A., "Development of a device to evaluate cork quality in the tree", Suberwood 2005-New challenges for the integration of cork oak forests and products, Huelva-Spain, October 2005.

Freitas, M. de, Reis, L., Li, B., "Comparative Study on Biaxial Low-Cycle Fatigue Behaviour of Three Structural Steels", Presented at XXII Encuentro del Grupo Español de Fractura, Almagro, Spain, March 9-11, 2005.

Li, B., Reis, L., Freitas, M. de, "Cyclic Plasticity and Fatigue Behavior of Structural Steels under Multiaxial Loading", Presented at Materials 2005, XII Portuguese Materials Society Meeting and III International Materials Symposium, Aveiro, March 20-23, 2005.

Reis, L., Li, B., Freitas, M. de, "Comparative Study of the Additional Hardening Effects of Three Structural Steels", Presented at Materials 2005, XII Portuguese Materials Society Meeting and III International Materials Symposium, Aveiro, Portugal, March 20-23, 2005.

Leite, M, Silva, A., Freitas, M. de, "Elastic Behaviour of Z Reinforced Sandwich Beams", 7th International Conference on Sandwich Structures, Denmark, 29-31 August, 2005.

Ribeiro, A. M. E., Maia, N. M. M., Silva, J. M. M., Reis, L., Freitas, M. de, "Free Vibration Response Using the Constant Hysteretic Damping Model", Presented at the 11th International Conference on Vibration Engineering, Timisoara, Romania, September 27 - 30, 2005.

Marat-Mendes, R., Freitas M. de, "Mode I, Mode II, Mode III and mixed mode interlaminar fracture of glass/epoxy unidirectional laminates", Presented at EUROMECH 473, Porto, Portugal, 27-29 October, 2005.

Carvalho, R., Freitas M. de, "Residual strength of a repaired laminated CFRP under compressive fatigue loading", Presented at EUROMECH 473, Porto, Portugal, 27-29 October, 2005.

Nunes, Teresa G.C., "Influence of Grain Size on the Setting of Portland Cement: a Stray-Field Magnetic Resonance Imaging Study", XII Portuguese Materials Society Meeting/ III International Materials Symposium, Aveiro Portugal, March 21-23, 2005.

Dencheva, N., Nunes, T.G., Oliveira, M.J., Denchev, Z., "Crystalline Structure of Isotropic and Oriented Polyamide 6 as Revealed by Solid State ¹³C-NMR and WAXS/SAXS from Synchrotron", XII Portuguese Materials Society Meeting/ III International Materials Symposium, Aveiro, Portugal, March 21-23, 2005.

Dencheva, N., Oliveira, M.J., Nunes, T.G., "Study on the Crystalline Structure of Polyamide-12 by Solid State ¹³C-NMR and Synchrotron WAXS and SAXS", XII Portuguese Materials Society Meeting/ III International Materials Symposium, Aveiro, Portugal, March 21-23, 2005.

Nunes, T.G., Polido, M., Amorim, A., Toledano, M., "Multinuclear Magnetic Resonance Studies on the Interaction of Self-Etching Adhesives to Different Dentin Regions", 83rd Meeting of the International Association of Dental Research, Baltimore, USA, March, 2005.

Nunes, T. G., "NMR and MRI of Dental Biomaterials: Recent Strategies", 1st Iberoamerican NMR Meeting/ 3rd Portuguese-Brazilian NMR Meeting, 9-13 May, Angra dos Reis, Rio de Janeiro, Brasil, 2005. (Plenary lecture)

Nunes, T. G., Garcia, F.C.P., Osorio, R., Toledano, M., Carvalho, R., "1H Solid-State NMR and Stray-Field MRI Studies on the Photopolymerization of Simplified Adhesive Systems", 1st Iberoamerican NMR Meeting/ 3rd Portuguese-Brazilian NMR Meeting, 9-13 May, Angra dos Reis, Rio de Janeiro, Brasil, 2005.

Pires, Ricardo, Fernandez, Christian, Nunes, T. G., "Stray-Field Imaging and Multinuclear Magnetic Resonance Spectroscopy Studies on Triple Curable Hybrid Glass-Ionomers", EUROMAR, Veldhoven, Holland, 3-8 July, 2005.

Ribeiro, M. Rosário, Bordado, João M., Campos, João, Nunes, T. G., "Synthesis and characterization of maleic Anhydride modified ethylene-diene copolymers", European Polymer Conference, Moscow, Russia, July, 2005.

Diogo, A. C., "Assessing the regeneration of recycled high-density polyethylene from rheological data", 10th International Workshop on Advances in Experimental Mechanics, Portoroz, Slovenia, 7-13 August, 2005.

Diogo, A. C., Baptista, E., Chainho, I., Velasco, J.I., "Rheological behaviour of polyolefin nanocomposites produced from anionic clays", 2. Annual European Rheology Conference AERC 2005, Grenoble, 21-23 April, 2005.

Diogo, A. C., Silva, A. C., "Assessing the regeneration of recycled high-density polyethylene from extensional flow and dynamic shear data", European Polymer Congress 2005, Moscow, Russia, 27 June -1 July 2005.

Pestana, Miguel, Albuquerque, Raúl M., Sardinha, José Luis, Louzada, P., Diogo, A. C., "New methodology to differentiate cork quality classes - the Dynamic mechanical thermal analysis, - Suberwood 2005: New challenges for integration of cork oak forests and products - Huelva, Espanha, 20-22 October, 2005.

Reis, N., Derby, B., "Digital Printing of Ceramics", Gordon Conference Solid State Studies in Ceramics, NH, US, 2005.

Saunders, R., Reis, N., Gough, J., Derby, B., "Deposition of viable mammalian cells via piezoelectric drop-on-demand ink jet printing", 19th European Conference on Biomaterials, Naples, Italy, 2005.

Coelho, Pedro G., Fernandes, Paulo R., Guedes, José M., Rodrigues, Helder C., Reis, Nuno, "Modelo computacional de remodelação óssea com aplicação em engenharia de tecidos", Congresso de Métodos Numéricos em Engenharia 2005, Granada, 2005.

Coelho, P.G., Fernandes, P. R., Guedes, J. M., Reis, N. and Rodrigues, H. C., "A hierarchical model for bone remodelling - application to scaffold design" ICCB 2005 - II International Conference on Computational Bioengineering, Lisbon, September 14-16, 2005.

Reis, N., Ferro, A. C., Pereira, J. C., "Geometry and Topology of 3D Voronoi Partitions", XII Portuguese Materials Society Meeting - III International Materials Symposium, Aveiro, Portugal, 2005.

Diogo, A. C., Silva, A. C., "Assessing the regeneration of recycled high-density polyethylene from extensional flow and dynamic shear data", Proceedings of the European Polymer Federation Congress 2005, Moscow, Russia, 2005.

Pestana, Miguel, Albuquerque, Raúl M., Sardinha, José Luis, Louzada, P., Diogo, A. C., "New methodology to differentiate cork quality classes - the dynamic mechanical thermal analysis", Proceedings Suberwood 2005: New challenges for integration of cork oak forests and products, Univ. Huelva, Spain, 2005.

Martins, R.F., Branco, C.M., "Failure analysis of conducts used in naval gas turbines", XII Portuguese Materials Society Meeting - III International Materials Symposium, Aveiro, Portugal, 2005.

- In national meetings

Oliveira, F. A. Costa, Matos, M. J., Vaz, M. Fátima, Dias, S. and Fernandes, J. Cruz, "Assessing the structure of ceramic foams through coupling of high resolution scanning electron microscopy with image analysis", Microscopy in Motion- XLth Reunião da Sociedade Portuguesa de Microscopia Electrónica e Biologia Celular, Dental Medical School-Lisbon, December 2005.

Leite, M., Lopes, J., Silva, A., "Estudo Experimental e Analítico, em Compressão, de Diferentes Espumas para Aplicação em Construção Sandwich", 6º Congresso Nacional de Mecânica Experimental, Ponta Delgada, 27-29 July, 2005.

Milharadas, M., Reis, L., Fonseca, A., Freitas, M. de, "Damage tolerance analysis of aircraft structures under service loading", Presented at 6º Congresso Nacional Mecânica Experimental, Açores, Portugal, 27-29 July, 2005.

Carvalho, M., Silva, A., "Estudo Experimental e Numérico de Colunas de Iluminação Conforme a Norma EN 40 "Lighting Columns". 6º Congresso Nacional de Mecânica Experimental, Ponta Delgada, 27-29 July, 2005.

Santos, S., Silva, A., "Aplicação de Materiais Compósitos em Componentes da Suspensão de Veículos Automóveis", 6º Congresso Nacional de Mecânica Experimental, Ponta Delgada, 27-29 July, 2005.

Morgado, T., Branco, C. M., V. Infante, "Cracking in housing of gear boxes in locomotives, Part II, Associação Portuguesa de Análise Experimental de Tensões Meeting, July 2005, Açores.

Campos, João, Bordado, João Moura, Nunes, T. G., Portela, M.F., Ribeiro, M. Rosário, "Synthesis and characterization of ethylene-diene copolymers containing anhydride functionalities", CHEMPOR, Coimbra, September, 2005.

Reis, Nuno, "Impressão de circuitos condutores utilizando tecnologia jacto de tinta", Jornadas de Engenharia da Universidade da Beira Interior, November, 2005.

Pestana, M., Sardinha, R., Lousada, J.L., Diogo, A. C., "Nova metodologia para diferenciar classes de qualidade da cortiça - A análise térmica dinâmica-mecânica", 5º Congresso Florestal Nacional, Viseu, 16-19 May, 2005.

C - Technical reports

36 month Final Technical Report of E.U. GROWTH Project "Ceramic and Carbon Fibers: Validation of Testing Methods" (contract no. G6RD

-CT-2001-00523), issued on October 2005.

Final Technical Report of E.U. GROWTH Project "Machine Vision Inspection of Polished Stone" (contract no. G1ST-CT-2002-50271), issued on April 2005.

M. de Freitas, Ensaio de fadiga em aços da ponte de Alcácer sobre o rio Sado

M. de Freitas e L. Reis, Fractura do veio de manivelas da máquina principal do N/M Açor B.

L. Reis e M. de Freitas, Estudo da causas da fissura de um cilindro do bloco do motor do Porsche 928 GTS coupé.

Branco, C.M., V. Infante, A. Sousa e Brito, "Failure analysis of a compressor blade (5th stage) of an aircraft gas turbine", IST, September, 2005.

Branco, C.M., Infante, V., Sousa e Brito, A. "Failure analysis of a cable in an helicopter of the Civil Protection Squad, IST, June 2005.

D - Meetings organization

- Organization of national or international conferences

A. Silva membro do Comité Organizador do 6º Congresso Nacional de Mecânica Experimental, Ponta Delgada, 27-29 Junho, 2005.

- Member of conferences scientific committees

M. Freitas membro do Scientific Committee do Materiais 2005, XII Portuguese Materials Society Meeting and III International Materials Symposium Aveiro, March 20-23, 2005.

Diogo, A. C. - Scientific Committee da "AERC-2005 2nd Annual European Rheology Conference", Grenoble, France, 23-13 April, 2005.

Diogo, A. C. - Scientific Advisory Board do "Europolymer Congress 2005", Moscow, Russia, 30 June - 4 July, 2005.

Diogo, A. C. - Scientific Committee da "Third International Conference on Engineering Rheology", ICER'2003, Zielona Gora, Poland, 23-26 August, 2005.

E - Advanced training

- PhD Thesis

Rui F.P. Martins, "Failure analysis for conducts of gas turbines used for naval propulsion", PhD thesis, Department of Mechanical Engineering IST, concluded May 2005, supervised by Profs. Moura Branco and Edgar Gomes

Sónia Gama Pereira, "Synthesis and study of novel polymeric materials for dental applications by nuclear magnetic resonance spectroscopy and imaging advanced techniques". IST, concluded, 29th April 2005 (Supervisor: Teresa G. Nunes)

Ana Sofia Dias Mestre, (in collaboration with FCUL) - on going, co-supervisor: M. Emilia Rosa

Fernando Francisco de Jesus Romeiro, "Propagação de fendas por fadiga em regimes de cargas de amplitude variável" - (submitted 2005, expected approval 2006), supervisor: M. Freitas.

Rosa Maria Marquito Marat Mendes - started 2005, supervisor: M. Freitas

- Master Thesis

Duarte, P.M.F., "Fatigue design of an articulate joint for trains", MSc thesis, Dep. Mechanical Engineering, IST, concluded, January 2005, supervised by Profs. Moura Branco and Virginia Infante.

Maria José Samora (in collaboration with FCUL) - on going, co-supervisor: M. Fátima Vaz

Marta Ferreira (in collaboration with FCUL) - on going, co-supervisor: M. Fátima Vaz

I - Laboratorial Prototypes

Diogo, A. C. and Reis, Nuno: fixture for the follow up of the kinetics of photopolymerisation of thermosetting resins in a RMS-800 Mechanical Spectrometer (dynamic mechanical follow up simultaneously with sample irradiation).

J - Patents

"Compact chamber of vacuum", PT-103234 Patent, 2005, Romeiro, F. and Fonte, M.

"Mecanismo montável em cadeiras de rodas para auxílio à subida e descida de degraus". Pedido de Patente de Invenção Nº PT 103 280, de 23 de Maio de 2005. Titulares: Instituto Superior Técnico e Humberto João Carreiras Paula. Inventores: Arlindo Silva, Humberto João Carreiras Paula. Boletim da Propriedade Industrial nº10, 2005, pp 3766 (Apêndice ao Diário da República de 31/Outubro/2005).

"Sistema de abertura e fecho de válvulas de admissão e de escape no motor de combustão interna". Pedido de Patente de Invenção Nº PT 103 282, de 27 de Maio de 2005. Titulares: Instituto Superior Técnico e Hugo Alexandre Andrade Valério. Inventores: Arlindo Silva, Hugo Alexandre Andrade Valério. Boletim da Propriedade Industrial nº10, 2005, pp 3766-7 (Apêndice ao Diário da República de 31/Outubro/2005).

"Sistema de elevação e deslocação de doentes acamados". Pedido de Patente de Invenção Nacional em Portugal PT 103 292, de 24 de Junho de 2005. Titulares: Instituto Superior Técnico, André Luz, Luis Lopes e Telmo Santos. Inventores: André Luz, Luis Lopes, Telmo Santos e Arlindo Silva. Boletim da Propriedade Industrial nº10, 2005, pp 3767 (Apêndice ao Diário da República de 31/Outubro/2005).

"Sinalizador auxiliar de travagem". Pedido de Patente de Invenção Nacional em Portugal PT 103 319, de 20 de Julho de 2005. Titulares: Instituto Superior Técnico, Francisco Diogo Quintão, James Gaspar e Pedro Santos Silva. Inventores: Francisco Diogo Quintão, James

"Suporte para transporte de pranchas de surf em bicicletas". Pedido de Patente de Invenção Nacional em Portugal PT 103 320, de 20 de Julho de 2005. Titulares: Instituto Superior Técnico, João Cascais e Tiago Alves. Inventores: João Cascais, Tiago Alves e Arlindo Silva. Boletim da Propriedade Industrial nº10, 2005, pp 3769 (Apêndice ao Diário da República de 31/Outubro/2005).

Others

- Member of editorial advisory board of international journals

C. M. Branco: member of Editorial Board of Theoretical and Applied Fracture Mechanics journal.

Virginia Infante: member of Editorial Advisory Board of Engineering Failure Analysis journal.

- Reviewing of papers in international scientific journals

A. C. Diogo: referee for Fuel journal and Composites Part A: Applied Science and Manufacturing journal.

J. C. Fernandes: referee for Materials Science Forum journal.

L. Guerra Rosa: referee for Composite Interfaces journal and Materials Science Forum journal.

L. Reis: referee for Materials Science Forum journal.

M. A. Fortes: referee for the Journal of Materials Science and the Philosophical Magazine.

M. Emilia Rosa: referee for the Philosophical Magazine.

M. Freitas: referee for Fatigue & Fracture of Engineering Materials & Structures journal; the International Journal of Fatigue; and Materials Science Forum journal.

M. F. Vaz: referee for the Soft Matter journal.

Teresa G. Nunes: referee for several international journals, including Polymer journal; Macromolecules journal; and the Journal of Biomedical Materials Research: Part B - Applied Biomaterials.

Data: sexta-feira, 5 de Maio de 2006


(assinatura do Responsável pelo Projecto)


05-05-2006 - 11:13



UNIÃO EUROPEIA - Fundos Estruturais



Governo da República Portuguesa

 Ciência, Inovação 2010 Programa Operacional Ciência e Inovação 2010

Instituto de Ciência e Engenharia de Materiais e Superfícies (Lisboa) - ICEMS [84]

[\[Página principal > Relatório científico 2005 \]](#)**Sub-projecto****Sub-project**

FUNCTIONAL MATERIALS IN ADVANCED CHEMICAL PROCESSES

Investigador responsável**Project leader**

Maria Norberta Neves Correia Pinho

Resumo da actividade desenvolvida

Synthesis and characterization of functional materials – catalysts, membranes & electrodes – and their applications in advanced chemical/electrochemical processes have been carried out according to planning, in three main directions:

Catalytic Reaction Processes**1 - Catalytic Functionalization of Light Alkanes**

Mechanistic effects induced by the cesium doping of unsupported nickel molybdate catalysts on *n*-butane oxidative dehydrogenation (ODH) with:

Catalyst preparation; doping by wet impregnation; catalysts analysis by inductively coupled plasma and atomic absorption; X-ray diffraction; surface composition by XPS; basicity by temperature programmed (TP) desorption of CO₂; TP reduction by hydrogen; behaviours of catalytic activity for the *n*-butane, 1- butene and *cis*-2- butene OHD. (Applied Catalysis A)

Investigation of the OHD of isobutane, over nanostructured silica - supported nickel molybdate catalysts with:

Preparation of supported catalysts; characterization by BET, X-ray diffraction and TEM with microprobe analysis; acid-base properties by TP desorption of ammonia and CO₂; isothermal reduction with isobutane; hydrogen TP reduction; catalytic activity by the continuous flow technique (Applied Catalysis A, in press)

2 - Selective Oxidation of Olefins over Mixed Oxides

Comparison of the TP desorption of oxygen on pure *a,b,g* e *g'* phases of the bismuth molybdates and on mixed phases by thermogravimetry and chromatographic techniques; correlation of the redox properties of the catalysts with the catalytic activity for the OHD of 1- butene; kinetics of the 1- butene reactions over bismuth molybdate catalysts by continuous flow and pulse techniques.

3 - Polymerisation of Olefins over Metallocenic Catalysts

Homo and copolymerization of vinyl based monomers by transition metal catalysts; development of alternative activators for metallocene systems; new routes for the development of polyethylene functional materials.

Synthesis and characterization of anhydride modified ethylene-diene copolymers;

study of supported metallocenes based on inorganic mesoporous materials, for polymerization of vinyl monomers; analysis of copolymers and correlation with the composition and distribution of polar units along the chain. (Polymer, communic. to European Polymer Conference and Chempor).

Membrane and Membrane Separations and Processes (MSP)**1. Preparation, functionalization and characterization of membranes**

Bi-soft segment membranes (PU(polypropylene)/polybutadiene; PU/polydimethylsiloxane; PU/inulin; PU/polycaprolactone) synthesis and characterization by ATR-FTIR, Positron Annihilation Spectroscopy(PALS), Electron Microscopy(SEM) and (TEM) and X-Ray Photoelectron Spectroscopy(XPS).

Characterization of membranes hemocompatibility (hemolysis, thrombosis) for blood oxygenators (POCTI/FCB/47661/2002).

Hard/soft/soft segment phase separation was correlated to gas permeation properties. (publications: Polymer, Mat. Sci. Forum, J. Appl. Polymer Sci. and Int. J. of Art. Organs).

Investigation on surface charge properties & zeta potential of membranes (2 communications; 3 publications: Desalination (in press), Chem. Eng. Sci. (in press), JMS (submitted)).

Investigation of selective transport mechanisms in controlled pore size cellulose acetate membranes (publication in JMS).

2. Modelling of Flow and Mass Transfer at Membrane/Fluid Interfaces

Ultrafiltration (UF)/Nanofiltration (NF)/Reverse Osmosis (RO) mass transfer modelling (Computer Fluid Dynamics/protein-membrane interactions) (publications: I.E.Ch.R., I.H.&M.T, Adv. Mat. For. III, Desalination).

Complex solutions (industrial broths) mass transfer modeling.

1. Development of Membrane Hybrid Processes

UF/NF for production of drinking water free of health hazards (3 communications; publication in Water Sci. & Tech.).

UF/NF for Cheese Whey valorization (3 communications; publications: Water Sci. & Tech. and J. Env. Manag.).

Electrodialysis(ED) for wine tartaric stabilization (publication in Ann. J. Enol. Vitic.); NF/ED for wine must concentration

Membrane integrated process for the recovery of clavulanic acid from fermentation broths and design of an industrial plant.

Group integration on a European Network of Excellence - "Expanding membrane macroscale applications by exploring nanoscale material properties" Contr. 500623-2.

Electrochemistry of Materials

Studies of fuel cells and hydrogen storage were carried out with particular concern on the development of mischmetal-based hydrogen storage electrode alloys (HSA). The electrochemical properties of PEMFC MEA using differently prepared HAS MI Ni_{3.65}Co_{0.85}Al_{0.3}Mn_{0.3} alloys as anode electrocatalysts instead of Pt/C alloys were studied, and the materials were developed. Different surface treatments were investigated and the electrochemical and electrocatalytic properties of the HAS electrodes were characterised. The effect of aluminizing on the hot corrosion resistance of two nickel-chromium alloys were studied. Nanostructured films of C60 were prepared electrochemically. Moreover the semiconducting properties of oxide/sulphide layers were characterized. As a result of these studies 16 communications were presented in International Conferences, and some papers were submitted for publication in Technical Journals. Studies of the electroreduction of CO₂ were initiated trying to obtain methane and other hydrocarbons.

A major activity in 2005 is a MSc project "Analysis of Boron Compounds Present in the Electrosynthesis of Sodium Tetrahydridoborate". The group is collaborating with a company (Omidea Lda) hosting a curricular trainee developing Direct Borohydride Fuel Cells.

Indicadores de execução 2005

| | Previsto | Realizado |
|---|----------|-----------|
| A - Publicações | | |
| Livros | 1 | 0 |
| Artigos em revistas internacionais | 20 | 12 |
| Artigos em revistas nacionais | 3 | 3 |
| B - Comunicações | | |
| Em congressos científicos internacionais | 23 | 38 |
| Em congressos científicos nacionais | 5 | 0 |
| C - Relatórios | 0 | 4 |
| D - Organização de seminários e conferências | 1 | 0 |
| E - Formação Avançada | | |
| Teses de Doutoramento | 2 | 2 |
| Teses de Mestrado | 1 | 0 |
| Outra | 0 | 1 |
| F - Modelos | 4 | 0 |
| G - Aplicações computacionais | 3 | 0 |
| H - Instalações Piloto | 0 | 0 |
| I - Protótipos laboratoriais | 4 | 0 |
| J - Patentes | 2 | 2 |

Publicações em 2005

A - Publications

- Papers in international journals

Narciso, Diogo, Fernandes, Cristina, Dos Santos, Paulo, Cameira, De Pinho, M. N., "New method for the estimation of the potassium hydrogen tartrate saturation temperature of port wines", *Am. J. Enol. Vitic.*, 56:3 255 - 265, 2005.

Costa, A. R., De Pinho, M. N., "Coagulation/ flocculation/ ultrafiltration for natural organic matter removal in drinking water production", *Water Science and Technology: Water Supply*, vol. 4 (5-6), 215-222, 2005.

Costa, A. R., de Pinho, M.N., "Effect of membrane pore size and solution chemistry on ultrafiltration for natural organic matter removal", *Journal of Membrane Science*, 255 (1-2) 49-56, 2005.

Geraldes, Vitor, Pereira, Nuno Escórcio, De Pinho, M. N., "Simulation and Optimization of Medium-Sized Seawater Reverse Osmosis Processes with Spiral-Wound Modules" *Ind. Eng. Chem. Res.*, 44(6), 1897-1905, 2005.

Queiroz, D. P., De Pinho, M. N., "Structural characteristics and gas permeation properties of Polydimethylsiloxane/poly(propylene oxide) urethane/urea bi-soft segment membranes", *Polymer*, 46, 2346-2353, 2005.

Magueijo, V., Minhalma, M., Queiroz, D., Geraldes, V., Macedo, A., and De Pinho, M. N. "Reduction of wastewaters and valorisation of by-products from "Serpa" cheese manufacture using nanofiltration", *Water Science & Technology* 52 (10-11), 393-399, 2005.

Magueijo, V., Semião, V., De Pinho, M. N., "Fluid flow and mass transfer modeling in lysozyme ultrafiltration", *International Journal of Heat and Mass Transfer*, Vol.48, 1716-1726, 2005.

Gomes, A. C., Gonçalves, I. C., de Pinho, M. N., "The role of adsorption on nanofiltration of azo dyes", *Journal of Membrane Science*, 255 (1-2): 157-165, 2005.

Madeira, L.M., Portela, M.F., "Mechanistic Effects Resulting from the Cesium - Doping of a NiMO₄ Catalyst in n- Butane Oxidative Dehydrogenation", *Applied Catalysis A: General*, 281, 179-189, 2005.

Zavoianu, R., Dias, A.P.V.S., Pavel, D.D., Angelescu, E., Portela, M.F., "1- Octene Metathesis on Silica Supported Zn - Doped NiMO₄ Catalysts", *Catalysis Communications*, 6, 321-327, 2005.

Yuan, Jian-Chao, Silva, L.C., Gomes, P.T., Valerga, P., Campos, J.M., Ribeiro, M.R., Chien, J. C. W., Marques, M.M., "Living and block polymerization of α -olefins using a Ni(II)- α -diimine catalyst containing OSiPh₂ tBu groups, *Polymer* 46, 2122-2132, 2005.

Chen, Y., C. A. C. Sequeira, Allen, Todd, Chen, Changpin, " Electrocatalytic activities of AB5 type hydrogen storage alloy as anode electrocatalyst of alkaline fuel cell", *J. Alloy Compounds*, 404-406, 661-664, 2005.

- Papers in national journals

Chen, Y., Sequeira, C. A. C., Song, Xueyan, "An outline of chemical vapour deposition technology, *Rev. Corr. Prot. Materiais*, 24(2), 52-56, 2005.

Sequeira, C. A. C., Santos, D. M. F., "Anodic limiting currents for iron in acidic sulphate electrolytes", *Ciência & Tecnologia dos Materiais*, 17 (1-2), 7-11, 2005.

Sequeira, C. A. C., Perdal, T.C.D., Santos, D.M.F., "Materials corrosion in molten carbonate fuel cells", *Ciência & Tecnologia dos Materiais*, 17 (1-2), 80-87, 2005.

B - Communications

- In international meetings

De Pinho, M. N., Costa, A. R., "Ultrafiltration and nanofiltration in the treatment of surface water for drinking water production", *Proceedings in 7th World Congress of Chemical Engineering*, Glasgow, United Kingdom, 10-14 July, 2005.

De Pinho, M. N., D.P. Queiroz, M.I. Pinto, M.H. Gil, A.J. Guimaraes, "Bi-soft segment urethane/urea membranes for extracorporeal blood oxygenators", *Proceedings in 7th World Congress of Chemical Engineering*, Glasgow, United Kingdom, 10-14 July, 2005.

Afonso, M. D., "Surface charge on loose nanofiltration membranes, *International Congress on Membranes and Membrane Processes*" - ICOM 2005, Seoul, South Korea, August, 2005.

Morão, Ana I. Cavaco, Alves, Ana M. Brites, Costa, Manuel C., Cardoso, Joaquim P., "Flux decline and foulants identification in the isolation of a fermentation product by nanofiltration", *Proceedings of ICOM 2005 pp 191 - International congress on membranes and membrane processes*, ICOM 2005, Seoul (South Korea), 21st-26th August, 2005.

Costa, A. R., De Pinho, M. N., "Performance and cost estimation of nanofiltration for surface water treatment in drinking water production", *7th World Congress of Chemical Engineering*, Glasgow, United Kingdom, 10 -14 July, 2005.

Costa, A. R., De Pinho, M. N., "Flocculation/ ultrafiltration of surface water for natural organic matter removal in drinking water production", *5º Congresso Ibero-Americano de Ciência e Tecnologia de Membranas*, Valencia, Spain 6 - 8 July, 2005.

Geraldes V., Catarino, I., de Pinho, M. N., "Simulação e optimização da ultrafiltração e diafiltração de leite para produção de queijo", *Actas do Congresso de Métodos Numéricos em Engenharia*, Granada, Spain, 4 - 7 July, 2005.

Geraldes, V., de Pinho, M. N., "Treatment of Surface Water by Nanofiltration using Spiral-Wound Modules", *5º Congresso Ibero-Americano em Ciências e Tecnologias de Membranas*, Valencia, Spain, 6 - 8 of July, 2005.

Beal, Lademir L., Catarino, Isabel, de Pinho, M. N., Mateus, Marília, dos Santos, José A. L., Minhalma, Miguel, "Saccharide separation through the use of membranes", *5º Congresso Ibero-Americano em Ciências e Tecnologias de Membranas*, Valencia, Spain, 6 - 8 of July, 2005.

Minhalma, Miguel, Domínguez, Joaquín R., De Pinho, M. N., "Treatment of cork processing wastewaters by an ozonization/ultrafiltration integrated process", *7th World Congress of Chemical Engineering*, Glasgow, Scotland, 10 - 14 of July, 2005.

Minhalma, Miguel, Domínguez, Joaquín R., De Pinho, M. N., "Cork processing wastewaters treatment by an ozonization/ultrafiltration integrated process", *International Congress on Membranes and Membrane Processes - ICOM 2005*, Seoul, South Korea, August, 2005.

Magueijo, V., Semião, V., De Pinho, M. N., "Effect of membrane pore size and membrane-solute interactions on lysozyme ultrafiltration", *Materiais 2005: III International Materials Symposium*, Aveiro, Portugal, 20 - 23 March, 2005.

Magueijo, V., Semião, V., De Pinho, M. N., "Ultrafiltração de Soluções Ternárias de Proteínas: Efeito da Difusão Cruzada e da Sucção no Transporte de Massa", *SEMNI 2005: Congresso de Métodos Numéricos em Engenharia*, Granada, Spain, 4 -7 July, 2005.

Magueijo, V., Semião, V., De Pinho, M. N., "Integrated modeling of protein ultrafiltration using computer fluid dynamics. The effect of suction", *WCCE7 - 7th World Congress of Chemical Engineering*, Glasgow, Scotland, 10 - 14 July, 2005.

Catarino, I., Martins, A. P. L., de Pinho, M. N., Duarte, E., "Ultrafiltration of skim sheep milk: Rennet coagulation properties and yields", *5º Congreso Iberoamericano de Ciencia y Tecnología de Membranas 2005*, Valencia, Spain, 6 - 8 July, 2005.

Queiroz, D. P., Pinto, I., Guimaraes, A.J.R.F., Gil, M.H.M., de Pinho, M. N., "Polyurethane-polyurea membranes for blood oxygenation", *MATERIAIS 2005, XII Portuguese Materials Society Meeting, III International Materials Symposium*, Aveiro, 20 - 23 March, 2005.

Pinto, I., Queiroz, D. P., Guimaraes, J., Gil, M. H., De Pinho, M. N., "Permeability and Hemocompatibility of Polyurethanes with two soft segments", *Engineering with membranes 2005: Medical and Biological Applications*, Camogli, Italy, 15-18 May, 2005.

Besteiro, M., de Pinho, M. N., Queiroz, D. P., Pinto, I., Gil, M. H., Guimaraes, A. J., "Preparation and Blood Competibility Evaluation of Segmented Polyurethanes for Extracorporeal Circulation", *6th Advanced Course in Cell-Material Interactions at Molecular Level*, Porto, 20 - 24 June, 2005.

Queiroz, Denise P., de Pinho, Maria N., "Bi-soft segment urethane/urea membranes for extracorporeal blood oxygenators", *7th World Congress of Chemical Engineering*, Glasgow, Scotland, 10 -14 July, 2005.

Queiroz, D. P., M. C. Gonçalves, De Pinho, M. N., "Bi-soft segment urethane/urea membranes structures", *Microscopy in motion*, Lisbon, Portugal, 8 - 10 December, 2005.

Ribeiro, M.R., Bordado, J.M., Campos, J., Nunes, T., "Synthesis and Characterization of Maleic Anhydride Modified Ethylene-Diene Copolymers", *European Polymer Conference*, Moscow, Russia, July, 2005.

Campos, J., Bordado, J.M., Nunes, T., Portela, M.F., Ribeiro, M. R., "Synthesis and Characterization of Ethylene-Diene Copolymers Containing Anhydride Functionalities" *CHEMPOR*, Coimbra, 2005.

Sequeira, C. A. C., "Semiconducting properties of oxide/sulphide layers formed on nickel-chromium alloys and their relevance to hot corrosion", *Proceedings of the 1st Int. Conf. on Diffusion in Solids and Liquids, DSL-2005*, University of Aveiro, vol.2, 651-654, 2005.

Sequeira, C. A. C., Lobo, R. F., Anastassakis, G., "A study of the redox chemistry of anthraquinone 2,7-disulphonate", *Proceedings of the 1st Int. Conf. on Diffusion in Solids and Liquids, DSL-2005*, University of Aveiro, vol. 2, 655-658, 2005.

Sequeira, C. A. C., Santos, D. M. F., Baptista, W., "Ring-disc studies of oxygen reduction at lanthanum calcium manganate in alkaline

medium", Proceedings of the 1st Int. Conf. on Diffusion in Solids and Liquids, DSL-2005, University of Aveiro, vol.2, 659-662, 2005.

Chen, Y., Sequeira, C. A. C., Song, X., "Ingress of hydrogen in Hastelloy C.", Proceedings of the 1st Int. Conf. on Diffusion in Solids and Liquids, DSL-2005, University of Aveiro, vol.2, 663-666, 2005.

Brito, P.S.D., Mota de Oliveira, A., Neves, F., Carvalho, J., Rodrigues, L., Pires, R., Sequeira, C. A. C., "Heavy metals recovery by electrochemical reactors from spent Ni/Cd batteries leaching solutions", Proceedings of ICIEM-2005, Portalegre, 18-20 May, p. 69, 2005.

Sequeira, C. A. C., Santos, D., Brito, P. S. D., "Mediated and non-mediated electrochemical oxidation of isopropanol", Proceedings of ICIEM-2005, Portalegre, 18-20 May, p.70, 2005.

Sequeira, C. A. C., Brito, P. S. D., "Ring-disc studies of oxygen reduction at lanthanum strontium manganate in alkaline medium", Proceedings of ICIEM-2005, Portalegre, 18-20 May, p.137, 2005.

Sequeira, C. A. C., Rodrigues, L.F.F.T.T.G., Brito, P. S. D., "Fuel cells for the combustion of gases resulting from the fermentation, gasification and pyrolysis of carbonaceous residues", Proceedings of ICIEM-2005, Portalegre, 18-20 May, p.142,143, 2005.

Marquis, F., Sequeira, C. A. C., "Development of impact resistant ceramic based composites by combustion synthesis", XII Portuguese Materials Society Meeting/ III International Materials Symposium, Aveiro, 20-23 March, Abstract T03.09, p.37, 2005.

Marquis, F., Sequeira, C. A. C., "Carbon nanotube composites for multifunctional applications", XII Portuguese Materials Society Meeting/ III International Materials Symposium, Aveiro, 20-23 March, Abstract T05.010, p.66, 2005.

Sequeira, C. A. C., Santos, D., Chen, Y., Martins, J.I.P., "Effects of temperature on the performance of the $MmNi_{3.6}Co_{0.7}Mn_{0.4}Al_{0.3}$ metal hydride electrode in alkaline solution", XII Portuguese Materials Society Meeting/ III International Materials Symposium, Aveiro, 20-23, Abstract T02.P4, p.144, 2005.

Santos, D., Sequeira, C. A. C., Parda, T., Alves, J., "Synthesis of sodium borohydride in alkaline medium and its relevance to energy systems", XII Portuguese Materials Society Meeting/ III International Materials Symposium, Aveiro, 20-23 March, Abstract T02.P5, p.144, 2005.

Chen, Y., C.A.C. Sequeira, "Electrocatalytic properties of some La_2Mg_{17} based metal hydride electrodes", XII Portuguese Materials Society Meeting/ III International Materials Symposium, Aveiro, 20-23 March, Abstract T02.P15, p.149, 2005.

Marquis, F., Sequeira, C. A. C., "Effect of aluminizing on the hot corrosion resistance of nickel-chromium alloys", XII Portuguese Materials Society Meeting/ III International Materials Symposium, Aveiro, 20-23 March, Abstract T03.P35, p.172, 2005.

Sequeira, C. A. C., Lobo, R., "Electrochemical preparation of C_{60} nanostructured films", XII Portuguese Materials Society Meeting/ III International Materials Symposium, Aveiro, 20-23 March, Abstract T05.P13, p.259, 2005.

Sequeira, C. A. C., Lobo, R., Anastassakis, G., "Electrochemical reduction of AQ27DS in aqueous solution", XII Portuguese Materials Society Meeting/ III International Materials Symposium, Aveiro, 20-23 March, Abstract T06.P12, p.297, 2005.

C - Technical reports

Catarino I., 2005, Research activity report - Osmose Inversa / Nanofiltração e Ultrafiltração no fabrico de queijo de ovelha e recuperação de Proteínas e Oligossacarídeos no soro de queijo, Research Scholarship TOTTA-UTL - 2004/2005

Progress report POCTI/FCB/47661/2002 - Development of new polyurea/polyurethane-based membranes for blood oxygenators.

3rd Technical Report corresponding to the 3rd year of execution (15 of October 2004 - 15 of October 2005) of the project POCTI/ EQU/ 39447/ 2001, FCT funding

Synthesis of novel hydrogen based fuels (confidential report, in collaboration with Omnidea, Lda.)

Report of "Projecto de Re - equipamento" - REEQ/764/EQU/2005 - "Network of laboratories of functional materials for reactions, membrane processes and fuel cells"

D - Meetings organization

- Scientific committees of congresses

Dr. Diná Afonso was member of the scientific committee of the International Congress on Membranes and Membrane Processes - ICOM 2005, Seoul, South Korea, August 2005.

Prof. Norberta de Pinho was member of the scientific committee of the International Congresses: 5º Congresso Ibero-Americano em Ciências e Tecnologias de Membranas, 6 - 8 of July 2005, Valencia, Spain; and MEMPRO3 - Intégration des membranes dans les procédés, 5 - 7 of April 2006, Nancy, France.

E - Advanced training

- PhD Thesis

Arlindo Carrico Gomes, "Estudo de um Bioreactor de Membranas no Tratamento de Efluentes Industriais". Co-supervision of Profª De Pinho, M. N., Supervision - Profª Isolina Cabral (Universidade da Beira Interior). Thesis discussed and concluded in May 2005.

Yun Chen, Hydride electrode alloys for PEM fuel cells, Supervisor: Sequeira, C. A. C., Approved on December 2005.

Ana Rita Gonçalves da Costa, "Mecanismos de Colmatação Coloidal em Ultrafiltração e Nanofiltração de Matéria Orgânica Natural de Águas de Superfície". Supervisor - Profª De Pinho, M. N., Started in June 2002.

Vitor Magueijo, "Dinâmica de Fluidos Computacional e Transferência de Massa em Ultrafiltração de Proteínas". Supervisor - Prof. De Pinho, M. N., Co-supervisor - Prof. Viriato Semião. Started in January 2002.

Ana Mourão, "Estudo e optimização de um processo integrado de membranas para o isolamento de um inibidor das β -Lactamases",

Supervisor - Prof. Ana Maria Alves. Started in 2004.

Antónia Teresa Zorro Nobre Macedo, "Ultrafiltração e Nanofiltração de Soro de Queijo de Serpa", Instituto Superior de Agronomia (ISA), Supervisores - Prof.ª Maria Norberta de Pinho e Prof.ª Elizabeth Duarte (ISA). Started in 2005.

Joana Luis Refoios Tudefa (Synthesis of modified polyolefins via copolymerisation with polar monomers)- on going, supervisor: Maria do Rosário Ribeiro.

João Miguel Dordio Campos (Development of supported catalysts for the olefin polymerization)- on going, supervisor: Maria do Rosário Ribeiro.

Luis Filipe Frechaut Tropa Torres Gonçalves, Electrochemistry of Prussian Blue in aqueous systems, Supervisor: Sequeira, C. A. C., Expected date of submission: April 2006

Rui Pedro da Costa Neto, Polymer fuel cells for electric vehicles, Supervisor: Sequeira, C. A. C., Expected date of submission: January 2006

Maria João Plancha Carriho, PEO-M Salts based electrolytes for primary cells, Supervisor: Sequeira, C. A. C., Expected date of submission: March 2006

- Master Thesis

Diogo M. F. Santos, Analysis of Boron Compounds Present in the Electrosynthesis of Sodium Tetrahydridoborate, Supervisor: Sequeira, C. A. C., Expected date of submission: March 2006

- Other

Research Scholarship UTL/IST/ISA - Isabel Catarino 2004/2005

J - Patents

Portuguese Patent PT102976 "Processo integrado de nanofiltração para redução do teor alcóico de bebidas", Quinta de Pancas/EST, De Pinho, M. N. , Fernando Gonçalves (inventors).

Internacional PCT WO 2004/113489 A1 "Integrated nanofiltration process to reduce the alcohol content of alcoholic beverages".

Others

- Reviewing of papers in international scientific journals

Dr. Diná Afonso reviewed 10 manuscripts submitted for publication in Journal of Industrial & Engineering Chemistry Research (1), Journal of Hazardous Materials (1), Journal of Membrane Science (4) and Desalination (4) in 2005.

Dr. Geraldine Vitor reviewed manuscripts submitted for publication in Journal of Membrane Science, Industrial Engineering Chemistry and Research e Separation Science and Technology in 2005

Dr. Minhama, Miguel reviewed manuscripts submitted for publication in Desalination in 2005

Prof. Norberta de Pinho reviewed manuscripts submitted for publication in Journal of Membrane Science, Canadian Journal of Chemical Engineering, Industrial & Engineering Chemistry Research (American Chemical Society), Advances in Environmental Research, Desalination, Separation and Purification Technology, Chemical Engineering Communications, AIChE Journal, Separation Science and Technology, Journal of Hazardous Materials, Polymer, Macromolecules, Biomacromolecules, International Applied Polymer Science, Computers & Chemical Engineering in 2005.

Prof. Manuel Farinha Porteira reviewed manuscripts submitted for publication in Applied Catalysis A (Elsevier) and Industrial and Engineering Chemistry Research (American Chemical Society) and abstracts of communications submitted for presentation at the 7th European Congress on Catalysis, Sofia, Bulgaria, 28 Aug - 1 Sept 2005 and Conference of Nanostructured Oxides, Louvain, Belgium, Jan 26-28, 2005.

Dr. Maria do Rosário Ribeiro, reviewed papers for international scientific journals, on the polymerisation field, such as "Macromolecular Chemistry" (Wiley); "European Polymer Journal" and "Catalysis Communications" (Elsevier).

Data: sexta-feira, 5 de Maio de 2006


(assinatura do Responsável pelo Projecto)

05-05-2006 - 11:18



UNIÃO EUROPEIA - Fundos Estruturais



Governo da República Portuguesa

Ciência, Inovação e Programa Operacional Ciência e Inovação 2010

2010