



Business Support on Your Doorstep

catalogue

Technology profile catalogue for participants of the
Nano Brokerage Event Prague 2009

4th June, Prague Congress Centre



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Hierarchical structures and coatings from dry nanoparticles dispersion TO

New procedure to obtain fullerenes and related molecules by a controlled dehydrogenation process TO

Photonic crystal for the enhancement of the efficiency more than 20% in solar cells, photodetectors and thermo-photovoltaic devices TO

Preparation of continuous in situ functionally graded materials by using spark plasma sintering technique TO

Silicon microspheres a new way to trap light TO

Tunable random laser TO

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Switzerland

ACI - University of Zurich

Sectors: Optoelectroactive polymers and their nanohybrids derived from both organic and inorganic species

Activities: Synthesis; Investigation of Structural and Physical (Optical, Electronic and Magnetic) properties; Applications in Device Technology

Technology keywords: Energy storage and transport; Materials Technology; Micro- and Nanotechnology related to physical and exact sciences; Nanotechnologies related to electronics and microelectronics

■ Know-how/ expertise

KHE_CH_27554

Title: Collaboration on development and application of optoelectroactive polymers with magnetic properties

Abstract: The Institute of Inorganic Chemistry (ACI) and the Institute of Physics at the University of Zurich, Switzerland offer state-of-the-art facilities for multidisciplinary research and development of materials tailored for high-tech and future industrial applications.

Detailed description: ACI and Institute of Physics, UZH can provide expertise in the following areas:

- Directed synthesis of functional inorganic materials
- Preparation of polymers with magnetic and optoelectronic properties
- Self-assembly and nanoscale formation of composites derived from the inorganic and polymer species
- Extensive study of materials properties by employing all techniques necessary for understanding the unique aspects of the materials
- Fabrication of devices and direct correlation of materials properties to device performance

Intellectual Property Rights: Others

Application Domains: Industrial manufacture; Materials technology; ENERGY

Comments about market applications: Photon detectors, Actuators, Organic electronics, Materials Science, Nanoscience

Collaboration Details: Technical co-operation:

Type of partner sought: Industries and Research Institutes interested in collaborations on the aforementioned topic

Network partner Euresearch

Sweden

Acreo AB

Technology keywords: Energy production, transmission and conversion; Environment; Materials Technology; Nanotechnologies related to electronics and microelectronics; Renewable Sources of Energy

Partner Search

PS_SE_27480

Title: Nanostructured semiconductor material for Solar cells and Imaging

Abstract: Acreo is a Swedish industrial research institute in the fields of electronics and optics. Our goal it to refine and transfer R&D results into industrially viable products and processes. The institute is active in the areas of Nanoelectronics, Fiber technology, broadband communication and Innovative electronics.

Acreo Nanoelectronics offers its strong expertise in design and fabrication of optoelectronic components based on semiconductor materials for future application to the development of high-performance solar cells and imaging sensors.

Detailed description: Acreo Nanoelectronics has a strong expertise in the design and fabrication of optoelectronic components with III-V semiconductor materials.

The institute offers material growth (incl. quantum dots), process capability (incl. nanoimprint lithography), component design and characterization.

Intellectual Property Rights: Patent(s) applied for but not yet granted

Application Domains: Materials technology; ENERGY; BIOLOGICAL SCIENCES; ENVIRONMENT; Environment protection

Comments about market applications: Photovoltaics, imaging, security and defence, enviromental monitoring.

Collaboration Details: Licence agreement: Technical co-operation:

Type of partner sought: Acreo is searching for partners with expertise in design and characterisation of solar cells to jointly develop next-generation photovoltaic components. Moreover we search for industrial and academic partners for further development of sensing technology and its commercialitation.

Network partner Acreo Ab

Sweden

Acreo AB

Technology keywords: Materials Technology; Nanotechnologies related to electronics and microelectronics

■ Technology Offer

TO_SE_27479

Title: Multi-parametric thermal sensor arrays for IR and THz

Abstract: A Swedish research institute that has developed bolometer detector arrays for IR imaging is searching for partners for further development of technology for multiparametric IR and THz imaging and sensing

Detailed description: Acreo is a Swedish industrial research institute with a strong expertise in development of optoelectronic semiconductor components. Acreo has developed bolometer detector arrays for IR imaging. Our concept uses a novel high-performance thermistor material based on quantum-well SiGe. The technology offers very low noise and high sensitivity, and CMOS and Si compatibility.
The technology is currently developed for a low-cost automotive night-vision system and can be further developed for different applications.
Interesting features and possibilities for technology development are:
- The monolithic integration of thermoelectrical elements for temperature control.
- Multi-spectral sensing

Intellectual Property Rights: Patent (s) granted

Application Domains: Industrial manufacture; Materials technology
Comments about market applications: Security, industrial process control, biomedical imaging, diagnostics, spectroscopy

Collaboration Details: Licence agreement: Technical co-operation:

Type of partner sought: The institute is looking for industrial and academic partners who want to cooperate on the development of the technology for IR and THz imaging and sensing.

Network partner Acreo Ab

Italy

ADVANCED & NANOMATERIALS RESEARCH S.r.l.

Sectors: nanostructured materials R&D, physical and chemical diagnostics of materials, micro- and nano- analyses

Activities: Material Science and processing of nanostructured materials. Technology-driven R&D of metallic and carbon-based nanoparticles, polymer and ceramic nanocomposites, thin film deposition and process, nanomaterials for catalysis, biotech, energy (solar, TPV, FC), hard materials, Aerospace, Optics, Electronics, and other sectors.

Technology keywords: Environment; Industrial Manufacture; Materials Technology; Renewable Sources of Energy

Technology Offer

TO_IT_27436

Title: Doped and undoped metal-oxide nanocolloids via Laser Ablation in Liquids for UV-enhanced chemiresistive sensors of toxic and flammable gases

Abstract: Our Laser Ablation in Liquids (LAL) technology is adapted to the fabrication of a vast range of different nanoparticles and nanocrystals, with controlled chemistry, size and morphology. The technique is scalable to industrial massive production through the integration of a continuous-flow system. The specific application to semiconducting metal oxide nanoparticles is being developed to produce finely tuned Ti, W, In, Zn, Sn oxide nanocolloids and the following thin or thick nanoporous films for chemiresistive sensors. The same technique allow the production of well defined nanoparticle colloids of transition metal oxides or noble metals to properly dope the above said semiconduction metal oxide films and allows the development of industrial grade room temperature (UV-enhanced) chemiresistive sensors for inflammable and toxic gases. The key factors that represent the main benefits of our technology are the simple fabrication process, the low energy consumption required, the absence of any waste by-product, the low loss of material, the eco-compatibility.

Detailed description: The nanoparticle colloids of Titanium, Indium, Tungsten, Zinc, Tin oxides are produced via simply irradiating with a visible pulsed laser beam of selected characteristics a target of the corresponding metal immersed in a solvent that favours the oxidation of the ablated material. The typical solvent is pure water, however other mixtures can be used, such as hydrogen peroxide dilute solutions, water-hydrocarbon mixtures. The proper choice of the solvent is strongly effective on the properties of the nanoparticles obtained. The integration of a continuous-flow system, currently under development, will permit a better processing of the nanocolloids and the production of relatively large volumes of colloidal solutions.

Innovation and advantages of the offer :
The innovative aspect of our LAL technique to produce nanoparticle colloids is the versatility, that is a vast range of finely tunable materials can be produced by just adjusting the laser parameters, the reaction liquid, the ablation target composition and the liquid flow rate in a continuous-flow system. The as obtained metal oxide nanocolloids have chemical and structural characteristics that enables their use in the fabrication of nanoporous films for chemical sensors. However, other applications are also possible, e.g. detoxifying catalytic surfaces, anti-bacterial additives, hardening additives for paints and varnishes, etc.

Intellectual Property Rights: Secret know-how

Application Domains: Materials technology; ENERGY; ENVIRONMENT; Environment protection
Comments about market applications: Nanostructured materials for life science and environment applications

Collaboration Details: Technical co-operation: Joint Venture agreement: Financial resources:

Type of partner sought: Company and/or research operating in the fields of life science and environment applications

Network partner Consorzio Catania Ricerche

CZECH REPUBLIC AGRA GROUP a.s.

Sectors: food - processing industry, agriculture

Activities: production of fertilizers, development and research

Technology keywords: Chemical Technology and Engineering; Micro- and Nanotechnology related to Biological sciences

■ Technology Request

TR_CZ_26842

Title: Nanotechnology for food and chemical industry

Abstract: The AGRA Group a. s. is a dynamically growing company whose core business is the production of fertilizers. All of the company's produce within this business line are the result of a long evolution of research and development activities within the agricultural industry. This intentional focus on innovation allowed the AGRA Group to become a leader in the foliar fertilizer market in the Czech Republic. Simultaneously, this allowed the company to pioneer the integration of nitrogen fertilizers based on stabilized urea in agricultural practice.

Detailed description: Presently, the company is expanding its activities through three original and innovative projects to the food industry. We are looking for new technology based on the use of nanotechnology in the food and chemical industries.

Intellectual Property Rights: Others

Application Domains: Chemical industry

Collaboration Details: Commercial agreement with technical assistance:

Network partner BIC Plzen - Business and Innovation Centre

Denmark

Aquaporin

Sectors: Water treatment

Technology keywords: Industrial Manufacture; Materials Technology; Micro- and Nanotechnology related to Biological sciences; Micro- and Nanotechnology related to physical and exact sciences

■ Know-how/ expertise

KHE_DK_27547

Title: Biomimetic membrane technology

Abstract: The Company develops a new, revolutionary water membrane technology based on proprietary intellectual assets. The Aquaporin membrane technology" is based on nature's own water filter, aquaporins, and capable of purifying water to a unique level, Absolute Pure Water. The Aquaporin membrane has demonstrated the potential to be vastly superior both in terms of efficiency and economy compared to any other known water purifying technology.

The technology has been validated in laboratory testing (proof-of-concept). First product launch is expected to take place in 2011. If successful, the potential applications of the technology include producing drinking water from sea water, desalination, etc.

Detailed description: The company has a biomimetic technology platform, capable of incorporating transmembrane proteins into a membrane, hereby being able to reuse the transporting mechanics developed by nature in an industrial context. The company is a SME, and is interested in entering into calls with biomimetic membrane focus

Intellectual Property Rights: Patent(s) applied for but not yet granted

Application Domains: Materials technology
Comments about market applications: biomimetic membrane technology for incorporating transmembrane proteins

Collaboration Details: Technical co-operation: Joint Venture agreement:

Network partner NO

CZECH REPUBLIC AQUATEST a.s.

Sectors: nanotechnology in remediation
Activities: contaminant removal; remedial actions; R&D
Technology keywords: Environment; Waste Management

■ Partner Search

PS_CZ_27313

Title: Field applications of zero-valent nanoiron

Abstract: remediation of contaminated soils, groundwater, surface water and wastewater with nano and biotechnologies;

Detailed description: application projects on zero-valent iron application for groundwater remediation; other chemical and biological methods of groundwater and wastewater treatment; access to different polluted sites

Intellectual Property Rights: Others

Application Domains: Environment protection

Network partner NO

CZECH REPUBLIC ATG s.r.o. - Nanopin, the Research Centre for Nanosurface Engineering

Sectors: Nanotechnology

Activities: The Research Centre for Nanosurface Engineering

Technology keywords: Environment; Industrial Manufacture; Materials Technology; Micro- and Nanotechnology related to physical and exact sciences; Waste Management

■ Know-how/ expertise

KHE_CZ_26946

Title: The increase of the fundamental knowledge of nanocrystalline photoactive materials - critical issues

Abstract: The Research Centre for Nanosurface Engineering "NANOPIN" was established in 2005 under the Research and Development Program of the Ministry of Education, Youth and Sports of the Czech Republic as a Centre of Applied and Oriented Research (Project No. 1M0577). Five partners; the Advanced Technology Group, the Institute of Inorganic Chemistry of the Academy of Sciences of the Czech Republic, the J. Heyrovsky Institute of Physical Chemistry of the Academy of Sciences of the Czech Republic, the Institute of Chemical Technology Prague and the Technical University Liberec, form Research Centre.

The main subjects of the scientific activity of the Centre comprise the complex study of unique photocatalytic properties of nanocrystalline photoactive materials (mostly titanium dioxide) and research of their practical utilisation in the field of self-cleaning, anti-bacterial coatings, photocatalytic purification of water, air and contaminated soil, organic synthesis and solar energy conversion.

Detailed description: The knowledge transfer should increase the fundamental knowledge of nanocrystalline photoactive materials and development of new products, which utilize self sterilizing and self cleaning photoactive materials in specific industrially relevant application fields such as self-cleaning and anti-microbial surfaces, water treatment, air purification and general hygienic applications. The emphasis is given to:

- the development of EU standards for the characterization of photocatalytic materials
- the photocatalytic field materials and technologies verification. Present status of photocatalytic ISO and CEN standardization.
- risk hazard of nanotechnologies towards photocatalytic application.

The objective is to present recent progress in the photocatalytic applications, standardization and testing methods in order to support involved industry as well as to protect customers. The core objective is: "to understand each other in fundamental research we need the common testing method language, to succeed in application we need to be reliable to users".

Intellectual Property Rights: Others

Application Domains: Industrial manufacture; Materials technology; ENVIRONMENT; Environment protection

Comments about market applications: Glass and ceramic industry, manufacturing of products with self-cleaning surfaces or surfaces with defined surface energy, construction industry, water

and air cleaning, paints and varnishes industry. Research institutes, universities, laboratories.
The potential domain of application is not limited.

Collaboration Details: Technical co-operation:

Type of partner sought: Companies producing products with self-cleaning surfaces, laboratories and research institutes.

Network partner BIC Plzen - Business and Innovation Centre

CZECH REPUBLIC ATG s.r.o. - Nanopin, the Research Centre for Nanosurface Engineering

Sectors: Nanotechnology

Activities: The Research Centre for Nanosurface Engineering

Technology keywords: Industrial Manufacture; Materials Technology; Micro- and Nanotechnology related to physical and exact sciences; Waste Management

Technology Offer

TO_CZ_26935

Title: Self-cleaning performance of nano TiO₂ layers _ evaluation method

Abstract: The Research Centre for Nanosurface Engineering "NANOPIN" was established in 2005 under the Research and Development Program of the Ministry of Education, Youth and Sports of the Czech Republic as a Centre of Applied and Oriented Research (Project No. 1M0577). Five partners; the Advanced Technology Group, the Institute of Inorganic Chemistry of the Academy of Sciences of the Czech Republic, the J. Heyrovsky Institute of Physical Chemistry of the Academy of Sciences of the Czech Republic, the Institute of Chemical Technology Prague and the Technical University Liberec, form Research Centre.

The main subjects of the scientific activity of the Centre comprise the complex study of unique photocatalytic properties of nanocrystalline photoactive materials (mostly titanium dioxide) and research of their practical utilisation in the field of self-cleaning, anti-bacterial coatings, photocatalytic purification of water, air and contaminated soil, organic synthesis and solar energy conversion.

Detailed description: In cooperation with research centre of a university an evaluation method of self-cleaning performance of photo-catalytic (TiO₂) layers has been developed. Based on ISO/TC206 standard proposal, a contact angle measurement is performed in order to determine the self-cleaning effect. A special-purpose software was developed for the measurement of the self-cleaning performance with See System, an easy-to-use device for contact angle and surface energy measurement.

The measurement method is based on ISO/TC206 standard proposal. The water contact angle on applied layer of oleic acid of defined thickness is measured as a function of irradiation time. The photocatalytic effect (rate of contact angle change, final contact angle) is determined from the temporal dependence. The contact angle is measured by See System. See System is a computer-aided instrument. The hardware consists of instrument base, movable sample holder and movable digital camera with necessary electronics. The camera is connected to PC via standard USB interface. The developed special-purpose software handles all necessary operations: displays the camera signal, captures the images of water drops, fits the drop profile, determines the contact angle between the phases and constructs the worksheet according to ISO/TC206 standard proposal. The results can be exported into common file types. The large spread of the method can be expected after homologation. Contact angle measurement is performed by non-invasive image sensing with a digital camera. The drop of distilled water, placed on the surface, leaves no layer change after the drop evaporation. The measurement is quick, the instrument is simple, low-cost, easy-to-use and mobile. A special software for evaluation of surface energies from the contact angles is available, too.

The institutions involved in the instrument development have a large experience in surface diagnostics. The research centre and the SME make use of long-term research of layer preparation and diagnostics at the Department of Physical Electronics of the University. The institutions also cooperated with ISO standard proposer on the proposal specification.

Intellectual Property Rights:

Others

Application Domains:

Industrial manufacture; Materials technology; ENVIRONMENT; Environment protection

Comments about market applications:

Glass and ceramic industry, manufacturing of products with self-cleaning surfaces or surfaces with defined surface energy, construction industry, water and air cleaning, paints and varnishes industry. Research institutes, universities, laboratories.
The potential domain of application is not limited.

Collaboration Details:

Technical co-operation: Commercial agreement with technical assistance:

Type of partner sought:

Companies producing products with self-cleaning surfaces, commercial representation companies interested in dealing the method (the device + software), laboratories interested in further development of the method.

Network partner

BIC Plzen - Business and Innovation Centre

Spain

Befesa Agua

Sectors: Water

Activities: Supply, wastewater & sludge treatment, desalination.

Technology keywords: Environment; Micro- and Nanotechnology related to Biological sciences; Renewable Sources of Energy; Waste Management

Technology Request

TR_ES_27509

Title: Nanotechnologies on water treatment

Abstract: Befesa Agua is dedicated to the development of hydraulic infrastructures which generate water, protect our rivers and coastlines, avoid polluting the atmosphere and contribute to social development. Befesa is also committed to sustainable water management, supplying towns with water and providing sanitation services, developing and/or operating hydraulic infrastructures and integrating information and monitoring systems into the decisionmaking process which affects the water cycle.

Detailed description: We are interested in nanocatalysis and nanomaterials in order to improve the effectiveness of actual water treatment technologies, that includes drinking water, municipal & industrial wastewater and seawater for desalination.

Intellectual Property Rights: Others

Application Domains: ENERGY; BIOLOGICAL SCIENCES; ENVIRONMENT; Environment protection

Type of partner sought: We are looking for partners who combine both aspects: nanotechnology and water, seeing the potential integration on water treatment applications. We are open to collaborate with any role with enterprises (SME or Holdings), investigation centers & universities from every country and at any level of experience.

Network partner Fundacion Para El Fomento De La Investigacion Cientifica Aplicada Y La Tecnologia

CZECH REPUBLIC Bratri Wilhelmove Topas spol. s r.o.

Sectors: mechanical engineering
Activities: production of wire conveyor belts, metal nets and screens
Technology keywords: Industrial Manufacture; Materials Technology; Waste Management

Technology Request

TR_CZ_27584

Title: Nano coating - coating of wire conveyor belts, metal nets and screens and coating of tools for their manufacturing

Abstract: Company Bratri Wilhelmove Topas s.r.o. based in Prostejov, Czech Republic manufactures steel wire conveyor belts, as a component of transportation or technological equipment. The company is looking for easy applicable nano-coating already on the market for improving steel-wire conveyor belts properties, especially wear-resistance. Currently produced steel wires conveyor belts are usually used for mechanisation of the transportation or manipulation of objects of various natures, (type, size, dimensions, weight) in all branches of the industry; this especially applies in operations where conveyor belts from other materials (rubber, plastic, textile) are unsuitable because of working conditions.

Detailed description: The company would like to improve steel wire conveyor belts features, especially wear resistance. The idea is to both find a partner, who can provide suitable nano-coating technology, which will meet desired requirements (improving wear resistance, improving friction coefficient etc.) and also find a partner who might need the steel wires (netting) for its own production or assembly.

Intellectual Property Rights: Others

Application Domains: Industrial manufacture; Materials technology
Comments about market applications: Possible connection of developed nano-coating with existing and market-proven wires and netting.

Collaboration Details: Technical co-operation: Commercial agreement with technical assistance:
Financial resources:

Type of partner sought: Type of partner sought:
Industrial partner from nano-technology area who would offer ready market solution for steel wires coating and also might need such coated wires (netting) for its own products.

The specific area of activity of the partner:
Production or assembly of nano-coating

The tasks to be performed of the partner sought:
Application of nano-coating on steel wires conveyor belts and netting manufactured by BW-TOPAS and preferably also purchasing the nano-coated steel wires or wire conveyor belts from the BW-TOPAS and their exploitation by the partner is sought.

Network partner Technology Centre Of The Academy Of Sciences Of The Czech Republic

CZECH REPUBLIC Brno University of Technology

Sectors: Research, education

Technology keywords: Materials Technology; Nanotechnologies related to electronics and microelectronics; Renewable Sources of Energy

Partner Search

PS_CZ_27491

Title: Molecular semiconductors for optoelectronic applications

Abstract: With more than 23,000 students, the Brno University of Technology is one of the largest universities in the Czech Republic. The brokerage participant represents the working group of physics and chemistry of responsible smart materials, which is well established research team with long term experience in the field of inorganic and organic semiconductors. The research activities are focused on characterization and application of the organic semiconductors and molecular systems for nanoelectronics, organic and large area electronics such as sensors, photodetectors, organic solar cells and molecular switches

Detailed description: We would like to find a partners (research institutions/companies) for collaborative research projects NMP- FP7 for related calls published in 2009/2010. We offer our strong experiences in development and characterization of organic and hybrids focused on photogeneration of charge carriers and their transport. Our experineeces are based on wide international cooperation, e.g. in the consortium of FP7 project DEPHOTEX Development of Photovoltaic Textiles based on novel Fibres.

We could to this project the following contributions:

1. Developement of organic semiconductors and deposition of thin films: liquid processing technique (spin coating, injet printing microdispensing) and vacuum evaporation
2. Photocurrent spectroscopy and time resolved photocurrent measurements (quantum yield of charge carrier generation, charge transport and charge traps, charge carrier mobility)
3. Steady state and time resolved optical spectroscopy (time resolved spectroscopy supported by 30 ps NdYAG laser and ICCD, UV VIS, IR and luminescence spectroscopy)
4. Study of electronic properties of thin films (space-charge-limited current techniques, impedance spectroscopy, photoconductivity, electroluminescence, homogeneity of thin films)
5. Study of morphology and optical prpertiesof thin films (optical and confocal microscopy, AFM, elipsometry, measurement of an areal distribution of reflectance and light scattering)

Intellectual Property Rights: Others

Application Domains: Materials technology; Chemical industry; ENERGY
Comments about market applications: Materials Science, Photovoltaics, Nanotechnology, Molecular electronics

Collaboration Details: Technical co-operation: Financial resources:

Type of partner sought: We would like to find a partners (research institutions/companies) for collaborative research projects NMP- FP7 for related calls published in 2009/2010.

Network partner JIC - South Moravian Innovation Centre

CZECH REPUBLIC COMTES FHT a.s.

Technology keywords: Materials Technology

■ Partner Search

PS_CZ_27493

Title: Ultra fine grained microstructure of metals

Abstract: Research of new metallic alloys and development of their processing technologies. Mechanical testing of metallic materials, heat and thermomechanical treatments of metals, numerical simulations of technological processes and metallographic analysis of materials.

Detailed description: Formation of ultra fine grained microstructure of metals has been prepared by severe plastic deformation. Different SPD techniques have been used. The final microstructure characterization is influenced by applied SPD method and deformation conditions. The Equal Channel Angular Pressing (ECAP) has been applied to obtain very fine microstructure of carbon steels and aluminium alloys. The resulted average grain size is below 1 micrometer. The morphology of pearlite lamellae in steels microstructure are modified also. The technology of High Pressure Torsion (HTP) has been used too. But, slowly heterogeneous ultra fine microstructure has been attained through the cross section. The effect of Constrained Groove Pressing (CGP) technology has been tested. The own construction tool designs were applied. The result microstructure changes enables to reach very interesting mechanical properties of metals. Mainly, the proof strength significant improvement are obtained.

Intellectual Property Rights: Others

Application Domains: Materials technology
Comments about market applications: Searching for research partners

Type of partner sought: COMTES FHT Inc. looks for research partners who take interest to develop processing technologies of ultrafine grained materials. The possibility of SPD experimental work, e.g. accumulative roll bonding (ARB), is welcomed.

Network partner BIC Plzen – Business and Innovation Centre

CZECH REPUBLIC COMTES FHT a.s.

Technology keywords: Industrial Manufacture

■ Technology Offer

TO_CZ_27494

Title: Accelerated sferodization and grain refinement

Abstract: Research of new metallic alloys and developmment of their processing technologies. Mechanical testing of metallic materials, heat and thermomechanical treatments of metals, numerical simulations of technological processes and metallographic analysis of materials.

Detailed description: Original technology of thermomechanical treatment which enables preparation of very fine grained microstructure with globular carbides morphology in rare short time. The excellent combination of mechanical properties are ensured by this modern technology. Mainly, the extraordinary notch toughness is reached, although common low cost materials with simple chemical composition were treated. Offered technology enables reduction of heat treatment considerably and thus, significant energy saving

Intellectual Property Rights: Patent(s) applied for but not yet granted

Application Domains: Industrial manufacture
Comments about market applications: Searchning for industrial partners

Collaboration Details: Licence agreement:

Type of partner sought: COMTES FHT Inc. looks for industrial partner to offer new technology for implementation to production process. The combination of excellent mechanical properties, mainly extraordinary high KCV values , and cost saving are main features of offered technological process. This technology can be implemented to production lines which use the technology of steel rolling, drawing, open and die forging, etc.

Network partner BIC Plzen – Business and Innovation Centre

Spain

Consejo Superior de Investigaciones Científicas (CSIC)

Technology keywords: Energy production, transmission and conversion

Technology Offer

TO_ES_26945

Title: FUEL CELL ANODE ELECTROCATALYST WITH EXTREMELY HIGH LEVEL OF CO TOLERANCE

Abstract: The Spanish National Research Centre (CSIC) is the largest public research institution in Spain. The CSIC is a multidisciplinary organisation with 130 centres located nationwide and a workforce of 13000. The CSIC files an average of 60 international PCT applications and 150 Spanish patent applications and signs more than 60 technology licenses each year.

Detailed description: The use of both hydrogen from the reforming process as fuel for Proton Exchange Membrane Fuel Cell (PEMFC) and methanol as fuel for Direct methanol Fuel Cells (DMFC) inevitably implies the presence of CO that deactivate fuel cell anode electrocatalyst. This deactivation causes irreversible losses of ideal potential reducing the efficiency of the system. This fact constitutes one of the main problems for the implementation of the fuel cell technology.

The electrooxidation of CO adsorbed on electrocatalysts (stripping technique) provides information about the capability of the electrocatalyst for CO oxidation to CO₂. A low onset potential of CO oxidation indicates a good CO-tolerance of the electrocatalyst.

Recently, the Spanish National Research Centre (CSIC) has prepared and patented fuel cell anodic catalysts that show a surprisingly high level of CO tolerance. It is the first time that electrocatalysts show the onset potential for CO₂ from 0.1 V referenced to the normal hydrogen electrode (NHE). These results are highly encouraging, since the usual onset potential for CO₂ obtained, at the moment, is in between 0.2-0.4V. Therefore, the electrocatalysts obtained in the present invention make possible an increment of the fuel cell potential and therefore a higher efficiency of the fuel cell.

These catalysts are based on PtRuMo supported on carbon black. An additional advantage of using these ternary catalysts for fuel cell anodes compare with the conventional binary PtRu ones is their costs. The incorporation of Mo by partially replacing Pt and Ru in the electrocatalysts reduces the costs of the system and, therefore, the anode fuel cell costs. The advantages of using these ternary catalysts PtRuMoOx/C compare with the conventional binary catalysts PtRu/C for fuel cell anodes are:

- (1) a reduction of the amount of Pt and Ru in the electrocatalysts by partially replacing these precious metal with Mo, decreasing the costs of the electrocatalysts and, therefore, the anode fuel cell.
- (2) a significant increase of the electrocatalysts CO tolerance, avoiding the anode deactivation when hydrogen from the reforming process or methanol is used as fuel.

Intellectual Property Rights: Patent(s) applied for but not yet granted

Application Domains: ENERGY
Comments about market applications: Production of fuel cell components. Energy or automotive sectors

Collaboration Details: Licence agreement: Technical co-operation:

Type of partner sought: The research centre is looking for a partner for a further development of the

technology which includes (i) the incorporation of the electrocatalysts in a monocell, and (ii) the development of fuel cell prototype with these kinds of electrocatalysts.

Network partner

Consejo Superior De Investigaciones Científicas

Spain

Consejo Superior de Investigaciones Científicas (CSIC)

Technology keywords: Materials Technology

Technology Offer

TO_ES_26950

Title: MULTIFUNCTIONAL SENSOR BASED ON BI-PHASE MAGNETIC MICROWIRES

Abstract: The Spanish National Research Centre (CSIC) is the largest public research institution in Spain. The CSIC is a multidisciplinary organisation with 130 centres located nationwide and a workforce of 13000. The CSIC files an average of 60 international PCT applications and 150 Spanish patent applications and signs more than 60 technology licenses each year.

Detailed description: Multilayer magnetic microwires represent a new family of magnetic materials having excellent magnetic and mechanical properties, which makes them attractive components as core elements in sensing technologies. These microwires are composed of a metallic nucleus made of an amorphous glasscoated microwire obtained by the *_quenching and drawing_* rapid solidification method. On top of the glass coating, a few nanometers thick Au layer is sputtered and used as electrode to grow an outer magnetic layer by electroplating technique.

The sensor makes use of the change in electrical inductance, L, of the metallic nucleus when the external environmental condition of interest changes (e.g. temperature, magnetic field, or mechanical stress). Thanks to the presence of the outer shell, the otherwise weak L response is magnified resulting in a very sensitive sensor with very short time response. This is achieved through magnetostatic and magnetoelastic coupling between inner nucleus and outer shell.

Electrical contact needs to be established in the nucleus only. In some specific cases, the outer magnetic layer can be premagnetised to bias the linear response zone and so to improve the response. The sensor is also adaptable to different electronic solutions and can be used to measure impedance, I, or voltage, V, instead of L.

In most case the multilayer sensor can be used in non-contact mode, for example as temperature and magnetic sensor. The typical dimension of the sensing element (multilayer microwire) is of 5 to 10 mm length for total 20-40 micron in diameter. For instance, in the case of the measuring variation in temperature, the relative change of impedance can reach above 20%/°C sensitivity, and the response time of 0.5 s. Its small dimensions and good mechanical robustness allows the sensor to be included in very small electronic circuits.

Intellectual Property Rights: Patent(s) applied for but not yet granted

Application Domains: Materials technology
Comments about market applications: The specific application here introduced is a multifunctional sensor device based on multilayer magnetic microwires and its use not only as magnetic sensor, but also as position sensor, temperature sensor, stress sensor, chemical sensor, and optical sensor.

Collaboration Details: Licence agreement: Technical co-operation:

Type of partner sought: The multifunctional sensor device can be applied in different industrial sectors as automotive, construction, aeronautic, mobile phone manufacturers

Network partner Consejo Superior De Investigaciones Científicas

Spain

Consejo Superior de Investigaciones Científicas (CSIC)

Technology keywords: Energy production, transmission and conversion; Energy storage and transport; Nanotechnologies related to electronics and microelectronics

Technology Offer

TO_ES_27155

Title: NANOSTRUCTURED HIGH-TEMPERATURE SUPERCONDUCTOR

Abstract: The Spanish National Research Centre (CSIC) is the largest public research institution in Spain. The CSIC is a multidisciplinary organisation with 130 centres located nationwide and a workforce of 13000. The CSIC files an average of 60 international PCT applications and 150 Spanish patent applications and signs more than 60 technology licenses each year.

Detailed description: Superconductor 2nd-generation conductors show great potential to carry large currents without resistance in long lengths. Epitaxial YBCO superconductors on flexible textured metallic substrates find applications as conductors for a wide variety of areas such as electronics, power, medical diagnosis or transport vehicles, being the most intuitive, superconducting cables with zero electrical resistance. The requirements for marketable products are high critical current densities at self-field and, specially, at strong magnetic fields. Vortex pinning centers must be introduced artificially inside the superconductor to sustain high critical currents without electrical dissipation. Typically the size of the pinning centers lies around 10-20 nm. In addition, their distribution inside the YBCO matrix is also relevant. Second generation YBCO coated conductors are based on epitaxial oxide multilayer architectures in tape geometry. High critical currents, reduced tape anisotropy and good transport properties under high magnetic fields are achievable by nanoengineering vortex pinning centers, which can be realized by chemical solution Suitable second-phase nanoprecipitates segregate during film growth which induce a large defect density in the YBCO superconductor matrix leading to enhanced performance The production process is carried out at ambient pressure and inexpensive equipment is needed. Another nanostructuring approaches are also considered like stepwise nanodot surface decoration and YBCO growth. The described materials have been shown to break currently worldwide performance records in YBCO coated conductors. As a consequence, superconductor devices with enhanced transport capabilities, especially at high magnetic fields, are envisioned by means of this new nanostructuring technology

Intellectual Property Rights: Patent(s) applied for but not yet granted

Application Domains: Materials technology; ENERGY
Comments about market applications: The material is useful for superconducting cables, fault current limiters, magnetic energy storage systems, high-field magnets, compact transformers or highly-efficient motors.

Collaboration Details: Licence agreement:

Type of partner sought: Companies which manufacture superconducting cables interested to bright this superconductor material out to the market.

Network partner Consejo Superior De Investigaciones Científicas

Spain

Consejo Superior de Investigaciones Científicas (CSIC)

Technology keywords: Materials Technology; Nanotechnologies related to electronics and microelectronics

Technology Offer

TO_ES_27339

Title: ORGANIC SENSOR DEVICES SENSITIVE TO PRESSURE, STRAIN, DEFORMATION, AND TEMPERATURE

Abstract: The Spanish National Research Centre (CSIC) is the largest public research institution in Spain. The CSIC is a multidisciplinary organisation with 130 centres located nationwide and a workforce of 13000. The CSIC files an average of 60 international PCT applications and 150 Spanish patent applications and signs more than 60 technology licenses each year.

Detailed description: Nowadays there exist a growing need to produce strain, pressure and temperature sensors at low cost and having additional qualities to those offered by materials typically employed such as inorganic semiconductors, electrolytes, metals and catalytic materials. Organic materials of polymeric or molecular nature are good candidates to fulfil these requirements in sensors due to their low cost, good processability, high flexibility and low weight and also for the possibility to tune their properties by chemical synthesis. The present sensor devices are based on an organic conducting film with double layer structure (conducting organic salt crystallites + insulating polymer). The conductivity of this film presents a very high sensitivity to pressure, stretching, deformation and temperature. For example, electrical response to strain of these films permits gage factors as big as 37. The main features and advantages of these organic sensor devices are:

- The sensor is made of a very stable material combining conducting properties extremely sensitive to any deformation and temperature change, with the flexibility and transparency of a film.
- Reduction of sensor manufacturing costs due to use of few components and cheap materials, few manufacturing steps and preparation at atmospheric conditions
- Conducting properties of the sensor material can be tuned by simple modification of synthetic parameters or by the design of a pattern, at different scales, in the same layer of the sensing organic salt material.

Intellectual Property Rights: Patent (s) granted

Application Domains: Industrial manufacture; Materials technology
Comments about market applications: Remarkable applications of this technology are the generation of devices for the monitorization of biomedical parameters such as the pulse, breathing rate and intraocular pressure. Other applications deal with their implementation in smart textiles and shoes or automotive components.

Collaboration Details: Licence agreement: Joint Venture agreement:

Type of partner sought: Manufacture and distribution of medical instrumentation, medical devices and equipment, smart textile or shoe manufacturer, automotive component manufacturer.

Network partner Consejo Superior De Investigaciones Científicas

Spain

Consejo Superior de Investigaciones Científicas (CSIC)

Technology keywords: Micro- and Nanotechnology related to Biological sciences; Nanotechnologies related to electronics and microelectronics

Technology Offer

TO_ES_27340

Title: AN INSTANTANEOUS AND RELIABLE MEANS OF ASSESSING HEPATIC STEATOSIS FOR LIVER TRASPLANTS

Abstract: The Spanish National Research Centre (CSIC) is the largest public research institution in Spain. The CSIC is a multidisciplinary organisation with 130 centres located nationwide and a workforce of 13000. The CSIC files an average of 60 international PCT applications and 150 Spanish patent applications and signs more than 60 technology licenses each year

Detailed description: The fatty liver disease (FLD) is the accumulation of lipids histologically visible in the cytoplasm of the hepatocytes. It is the most common metabolic abnormality of the liver. The histological examination by puncture liver biopsy (PLB) allows the diagnosis of FLD, becoming the gold standard in diagnosing the disease. According to the percentage of hepatocytes affected, the FLD is classified mild (<30%), moderate (30-60%) and severe (> 60%). The PLB is an invasive method and it takes a long process, which at times, such as during a transplant, the results are obtained late. The FLD in the donor is the leading cause of liver failure after transplantation and it is the biggest cause of livers rejected for pathological reasons.
A new electronic device and method detect the degree of steatosis and the degree of impact on the liver microcirculation by the bioimpedance analysis of the liver tissue. The duration of this analysis is less than a minute. This technology has been tested in vivo with rats affected by different degrees of FLD by using an electronic device prototype with a biocompatible sensor, sterilizable and disposable for application in the operating room. This new sanitary device that allows the measure of the FLD in a few seconds improves the procedures for liver transplantation at the level of quality and safety by providing objective and rapid criteria of the viability of the organ (fat or microcirculation involvement) with respect to the usual procedures, that take hours (liver biopsy).
This equipment has an easy clinical use. There_s no similar equipment on the market. Knowing the steatosis degree in a few seconds is not possible with the methods used up to date in clinical practice.

Intellectual Property Rights: Patent(s) applied for but not yet granted

Application Domains: Industrial manufacture
Comments about market applications: Medical instrumentation, medical devices and equipment

Collaboration Details: Licence agreement: Technical co-operation:

Type of partner sought: Manufacture and distribution of medical instrumentation, medical devices and equipment, smart textile or shoe manufacturer, automotive component manufacturer.

Network partner Consejo Superior De Investigaciones Científicas

Spain

Consejo Superior de Investigaciones Científicas (CSIC)

Technology keywords: Micro- and Nanotechnology related to Biological sciences

Technology Offer

TO_ES_27447

Title: Micronano devices for disease diagnostics and drug delivery

Abstract: The Spanish National Research Centre (CSIC) is the largest public research institution in Spain. The CSIC is a multidisciplinary organisation with 130 centres located nationwide and a workforce of 13000. The CSIC files an average of 60 international PCT applications and 150 Spanish patent applications and signs more than 60 technology licenses each year.

Detailed description: The micronano devices, designed for being introduced into cells and tissues, can be functionalized with fluorescent molecules, proteins, antibodies or antitumoral drugs. The functionalization of the device can locate the device at a specific cell or tissue, where the device can deliver drugs or cause cell death by hyperthermia or releasing chemotherapy agents, which is very useful for cancer therapy.

The small dimensions of the micronano devices (between 5 µm and 20 nm) allow them to be introduced into cells and tissues by different procedures: phagocytosis, lipofection or microinjection. The devices are highly stable, allowing them to follow cellular processes for long periods of time and don't affect cell viability, as was shown by cell toxicity tests. The devices can be composed of different materials to define micronanosystems or to be covered by substances with different biological activities. The functional parts of the devices are defined by lithographic techniques that allow minimum dimensions. The fabrication techniques allow the production, with precision, of complex devices, batch mode production, low cost of fabrication and the production of more than 150 millions of identical devices at the same time. The intracellular parameters that can be measured can be physical, chemical or biological, as temperature, pressure, pH, redox potential, ion concentration, enzymatic activity, or the presence of a ligand or a protein. The device can emit signals proportional to the intracellular parameters detected. By means of this signal scientists and physicians can receive and analyze the information, which makes possible the early diagnostics of disease at cellular level. The device can act as a drug delivery carrier, allowing for controlled release of drugs at specific times, cells and tissues

Intellectual Property Rights: Patent(s) applied for but not yet granted

Application Domains: BIOLOGICAL SCIENCES
Comments about market applications: The devices offer a wide range of nanomedicine applications, specifically for disease diagnostics inside cells and tissues and for drug delivery.

Collaboration Details: Licence agreement:

Type of partner sought: The research centre is looking for a partners for further developments of specific applications of these micronano devices in order to introduce them into the market.

Network partner Consejo Superior De Investigaciones Científicas

Spain

Consejo Superior de Investigaciones Científicas (CSIC)

Technology keywords: Micro- and Nanotechnology related to physical and exact sciences

Technology Offer

TO_ES_27450

Title: ADIABATIC MAGNETOTHERMAL SETUP FOR SPECIFIC ABSORPTION
RATE MEASUREMENTS (SAR) IN MATERIALS

Abstract: The Spanish National Research Centre (CSIC) is the largest public research institution in Spain. The CSIC is a multidisciplinary organisation with 130 centres located nationwide and a workforce of 13000. The CSIC files an average of 60 international PCT applications and 150 Spanish patent applications and signs more than 60 technology licenses each year

Detailed description: The novel equipment allows the measurement of temperature increments in adiabatic conditions, thus enabling the determination of the specific absorption rate (SAR) with high accuracy. Adiabaticity is achieved under vacuum conditions and with the help of a radiation adiabatic screen around the sample to minimize heat exchange with the surroundings. The equipment also includes temperature sensors, criostats to hold the adiabatic screen and the sample holder, an inducting coil to generate an homogeneous alternating field, vacuum equipment and the corresponding temperature, power and current excitation electronic controllers. Data acquisition and measurement control is carried out by a specifically developed software. The main characteristic of this unique equipment is combining adiabaticity and ac magnetic field excitation. Thus, SAR can be directly determined with high accuracy from its basic principles avoiding complex corrections for thermal leaks necessary in non-adiabatic equipments.

Intellectual Property Rights: Others

Application Domains: Industrial manufacture; Materials technology
Comments about market applications: SAR measurements are very useful in biomedical and industrial applications based on hyperthermia technology using either magnetic and conducting nanoparticles, e.g., processing of polymers through homogeneous heating, selective heating, reversible soldering-desoldering of polymeric components, inductive glue-welding procedures, etc. SAR determination also allows indirect determination of dissipating materials properties such as their surface electrical resistivity.

Collaboration Details: Licence agreement:

Type of partner sought: A company able to fabricate and commercialise these new equipments is sought.

Network partner Consejo Superior De Investigaciones Científicas

Italy

Consorzio Catania Ricerche

Technology keywords: Materials Technology; Micro- and Nanotechnology related to Biological sciences; Micro- and Nanotechnology related to physical and exact sciences; Nanotechnologies related to electronics and microelectronics

■ **Technology Offer**

TO_IT_27296

Title: Surfaces and Interfaces Analysis Tecnology

Abstract: The Laboratorio of Surfaces and Interfaces (SUPERLAB, <http://www.ccr.unict.it/superlab>) is the laboratory of the Consorzio Catania Ricerche one of City Research Consortia of the Italian network of Universities - industrial liaison centres. The activity of SUPERLAB includes the preparation, modification and characterization of nanostructured solid surfaces, interfaces and thin films in fields such as Nano and Microelectronics, Optoelectronics, microelectronics packaging, Biomaterials, Polymeric Materials for optical application.

Detailed description: Research activities in the fields of Materials Science dealing with the preparation, modification and characterization of nanostructured solid surface, interface and thin films of the most relevant technology. The offered technology of Laboratory Superlab deals in the following areas:

1. Organic electronics
2. Printed electronics
3. Plastics electronics
4. Microelectronics packaging materials (Interfacial chemistry and adhesion of green epoxy-phenolic molding compounds onto various surfaces; reformulation of silver filled glues for die bonding of power microelectronics devices)
5. Biosensors
6. Biomaterials and supramolecular chemistry
7. Ion Polymer Metal Composites based artificial muscles, sensors and actuators

Intellectual Property Rights: Others

Application Domains: Industrial manufacture; Materials technology; ENERGY
Comments about market applications: Industries and research centres in the materials and surface areas.

Collaboration Details: Technical co-operation:

Type of partner sought: Companies, SME, Research Centres, Universities

Network partner Consorzio Catania Ricerche

Italy

Consorzio Catania Ricerche

Technology keywords: Environment; Materials Technology; Micro- and Nanotechnology related to Biological sciences

Technology Offer

TO_IT_27423

Title: Bio-compatible nanostructured coatings for optical bio-sensors

Abstract: Thin nano-grained carbon and carbon nitride films with tunable chemical structure and morphology to achieve the desired optical and bio-chemical performances. The technology allows homogeneous coatings of small area bio-sensors for in-vivo applications, e.g. implantable glucose sensors. Such films are necessary when a non-bio-compatible sensor active surface must be interfaced to human tissues. Further developments are planned to allow bio-selectivity of the permeability performances of our coatings.

Detailed description: The nano-grained DLC carbon or carbon nitride coatings are produced via Laser Ablation in controlled gas atmosphere, with a thickness ranging from a few nm to 500 nm. A vast range of substrate differing for chemistry and surface morphology can be coated. Among them, substrates with controlled nano-roughness or pre-coated with nanoparticles are of special interest for bio-molecules sensor devices based on optical probing (SERS, LSPR). The deposition is performed at room or moderate (less than 200 °C) temperature, a key factor to allow the integration of the process in the fabrication of bio-compatible devices containing temperature-sensitive active components.

Innovation and advantages of the offer :

The innovative aspect of our thin film coatings relies to the ability to properly tailor such films to obtain very thin layers of 5 to 10 nm with a narrow grain size distribution, with the possibility to tune both the electric properties (surface conductance) and mechanical/tribological properties. This offers a great advantage in choosing the most proper bio-compatible coating with selective VIS-IR transmittance, selective permeability to defined molecules.

Intellectual Property Rights: Secret know-how

Application Domains: Materials technology; BIOLOGICAL SCIENCES; Environment protection
Comments about market applications: Nanostructured materials for life science and bio-medical diagnostics

Collaboration Details: Technical co-operation: Joint Venture agreement: Financial resources:

Type of partner sought: Coatings of small area bio-sensors for in-vivo applications, e.g. implantable glucose sensors

Network partner Consorzio Catania Ricerche

Italy

Consorzio Catania Ricerche

Technology keywords: Materials Technology; Waste Management

Technology Offer

TO_IT_27424

Title: Bio-compatible polymer- stabilized Silver nanoparticle colloids with tuned size distribution via simple chemical bath routes

Abstract: Research based SME has developed simple chemical processes to produce stable colloids of noble metal nanoparticles, mainly Ag, stabilised by a bio-compatible polymer coating. In particular, a two-step UV-promoted process to produce a narrow distribution of Ag nanoparticles (80% or more are smaller than 10 nm) and stabilize them with Poly(metha-acrylic) acid has been defined and optimised. The great advantages of our process is the absence of toxic or hazardous reagents and solvents, the low energy consumption, the long term stability of the nanocolloids produced.

Detailed description: The process is divided in two steps, the first being addressed to the nanoparticle nucleation and the second dedicated to the polymer reticulation around the frozen nanoparticles. The only ingredients needed are the solvent (pure water), the Ag source, typically an Ag salt (e.g., AgNO₃) and the acidic polymer which plays the roles of both reducing and capping agent. The whole synthesis is carried out at room temperature, under selected UV irradiation. The PMA-coated nanoparticles colloids have a stability verified for 1 month storage in normal ambient conditions and in dark. Activities are currently ongoing to tune the synthesis process to get dendritic nanostructured PMA particles with a tunable decoration of Ag nanoparticles, for applications in the therapeutics field.

Innovation and advantages of the offer :
The innovative aspect of our materials and processes regards mainly the easy-to-scale synthesis, its eco- and bio-compatibility, the low process cost and energy demand. The obtained colloids of PMA coated nanoparticles are strongly indicated for textiles and package anti-bacterial and anti-biofouling applications.

Intellectual Property Rights: Secret know-how

Application Domains: Materials technology; BIOLOGICAL SCIENCES
Comments about market applications: Nanostructured materials for life sciences, textiles and packaging

Collaboration Details: Technical co-operation: Joint Venture agreement: Financial resources:

Type of partner sought: Organisations (company mainly) in the fields of life sciences, textiles and packaging

Network partner Consorzio Catania Ricerche

Italy

Consorzio Catania Ricerche

Technology keywords: Micro- and Nanotechnology related to Biological sciences

Technology Offer

TO_IT_27496

Title: PHARMACEUTICAL NANOEMULSION FOR THE EYE

Abstract: SIFI , consortium partner of Catanai Ricerche, is an Italian industrial group with the aim of eye caring. Italian market leader for the last decades, SIFI develops, produces and markets innovative pharmaceutical treatments, tools for diagnosis and surgical devices for prevention and care of the most common ocular pathologies. SIFI developed a proprietary emulsion composition useful as tear film stabilizer for dry eye therapy (CE mark) as well as for drug delivery to the eye. We are seeking for either License or

Detailed description: Tear film answers keeping the ocular surface wet, then protecting corneal and conjunctival epithelium and transporting biologically active substances useful for the physiology of the eye. The alteration of the proper surface tension and the evaporation speed of the tear film result in transient ocular dryness and possibly dry eye syndrome. A new stable oil on water (O/W) nanoemulsion suitable for ocular use, for restoring tear film properties and for carrying actives to the eye, is proposed. Our O/W nanoemulsion has very good ocular tolerability and long term stability and exhibits optimal effectiveness in the treatment of ocular dryness and dry eye (clinical studies). The natural phospholipids utilised as surfactant to obtain the micelles with the oily components, give to the oily micelles, a partial negative surrounding charge that make the emulsion better tolerated at the ocular level respect to the positively charged ones. The good emulsion ocular tolerability is due even to the long-chain natural triglycerides chosen for the formulation. The emulsion show very similar to meibum performance in reducing tear film evaporation rate, due to the particular ratio between the oily components and the phospholipids. The particular composition of the emulsion rises to obtain a good spreadability of the product on the ocular surface after topical administration. The capability to integrating meibum and the spreadability make the compositions useful for ophthalmic drug delivery, determining a good drug distribution and kinetics in the ocular tissues. After ocular administration, in fact, due to the ions present in the tears, the phases composing the emulsion are separated releasing the active principles. Moreover, in animal studies, this emulsion per se showed anti-inflammatory/anti-allergic activity.

Innovation and advantages of the offer :

The emulsion described is characterised by:

- Good ocular tolerability
- Long term stability at room temperature (25-30°C)
- Good spreadability on the ocular surface
- Physiological performance on reducing tear film evaporation rate, similar to meibum (lipidic natural component of tears)
- CE mark

Moreover, it is useful for ocular drug delivery of hydrophobic or amphiphilic

molecules.

Oil-in-water type emulsion; 250 nm average droplet size; negative zeta potential; stable at room temperature; low viscosity; milky-like coloured. Manufacturing process and blow-fill-seal packaging, unit-dose, preserve the product by oxidation phenomena.

Intellectual Property Rights: Patent(s) applied for but not yet granted
Commercial Agreement.

Application Domains: BIOLOGICAL SCIENCES
Comments about market applications: --Therapeutic
--Drug delivery
--Medical/Health related
--Pharmaceuticals/fine chemicals

Collaboration Details: Licence agreement: Commercial agreement with technical assistance:

Type of partner sought: Company interested in marketing and commercializing the product in its own territory

Network partner Consorzio Catania Ricerche

Italy

Consorzio Catania Ricerche

Technology keywords: Micro- and Nanotechnology related to Biological sciences

Technology Offer

TO_IT_27497

Title: NANOSYSTEMS AS DRUG DELIVERY FOR THE EYE

Abstract: SIFI, Consortium partner of Catania Ricerche, is an Italian industrial group with the aim of eye caring. SIFI develops, produces and markets innovative pharmaceutical treatments, tools for diagnosis and surgical devices for prevention and care of the most common ocular pathologies. SIFI is developing proprietary nanosystems to be applied topically on the eye, allowing to reach effective concentration of the carried active at the target site avoiding systemic or invasive treatments and related side effects. We are seeking for collaboration and financial support.

Detailed description: These nanostructures concern of polymeric, lipidic or mixed systems useful for the ophthalmic administration of drugs such as steroidal and non-steroidal anti-inflammatory agents, antimicrobial agents, antiangiogenic agents etc. These drug delivery systems allow, after ophthalmic administration, increasing the ocular bioavailability of the carried drug also at the posterior ocular segment that is the current ophthalmic pharmaceutical technology challenge.

Innovation and advantages of the offer :

Because of the unique structure of the eye that restricts the entry of drug molecules at the required site of action, ocular drug delivery remains as one of the most challenging task for pharmaceutical scientists. These polymeric, lipidic or mixed drug delivery nanosystems allow, after ophthalmic administration - with reference to conventional ophthalmic formulations - increased ocular bioavailability of the drug carried. Our nanosystems, especially those proposed for the posterior ocular segment, could be very useful to reach therapeutic concentrations avoiding invasive treatment as intra-vitreous injection, decreasing related side effects and consequently improving patient compliance.

Synthesis and freeze-drying know how with GMP manufacturing site. Animal models for the ocular posterior segment pathologies.

Intellectual Property Rights: Others

Application Domains: BIOLOGICAL SCIENCES
Comments about market applications: --Therapeutic
--Drug delivery
--Medical/Health related
--Pharmaceuticals/fine chemicals

Collaboration Details: Technical co-operation: Financial resources:

Type of partner sought: Company and/or Institution interested to co-develop or finance the development of nanosystems to target the ocular tissues.

Network partner Consorzio Catania Ricerche

Italy

Consorzio Venezia Ricerche

Sectors: RT & D
Activities: Nanotechnology and environment
Technology keywords: Environment; Waste Management

Partner Search

PS_IT_27505

Title: Nanotechnology and environment: benefits and risk

Abstract: The Consorzio Venezia Ricerche is a research organization that provides a direct link among Venetian Universities, research centres, public institutions, and private companies. Cooperating with various partners (industries, SME, universities, research centres), the Consorzio aims at developing research programmes based on technological and scientific methodologies, as well as creating and coordinating both national and international research projects. Our research areas are: environmental science, environmental technologies, and development of innovative materials / materials science.

Detailed description: Research project.
Research area: nanotechnology and environment
Our contribution: application of risk assessment tools and life cycle thinking approaches to assess potential environmental impacts due to nanotechnologies.

Intellectual Property Rights: Others

Application Domains: ENVIRONMENT; Environment protection

Network partner NO

Switzerland

CSEM Centre Suisse d'Electronique et de Microtechnique SA

- Sectors:** Applied Research, Product Development, Prototype and Low-volume Production, Technology Consulting
- Activities:** The main fields of activity are micro- and nanotechnologies, microelectronics, systems engineering, microrobotics, photonics, information and communication technologies.
- Technology keywords:** Materials Technology; Micro- and Nanotechnology related to Biological sciences; Micro- and Nanotechnology related to physical and exact sciences; Nanotechnologies related to electronics and microelectronics

■ Partner Search

PS_CH_27488

Title: R&D services in Nanotechnology and Life Sciences

Abstract: CSEM, the Swiss Center for Electronics and Microtechnology, Inc., is a privately held research and development company active in:

Applied Research
Product Development
Prototype and Low-volume Production
Technology Consulting

Its main fields of activity are micro- and nanotechnologies, microelectronics, systems engineering, microrobotics, photonics, information and communication technologies.

In providing its high-tech know-how and technological expertise, CSEM strives to anticipate the future needs of different markets in terms of new technologies and offers its services to industrial customers. It also develops its own commercial activities _ either together with existing companies or through the creation of spin-offs and start-up companies _ and actively contributes to developing Switzerland as a high-tech industrial location.

Detailed description: CSEM participates frequently in EC funded projects, which target to collaborative research. Our available technologies are:

"MOEMS and plasmonics:

- IR Spectrometers based on MOEMS gratings
- IR Lasers with External Cavity Feedback
- Enhanced Photonic Components
- Optical Probes for Neurophysiology

"Nanostructuring:

- Security Features based on Anticounterfeitable Nanostructures
- Light Harvesting Layers for Photovoltaics
- Multifunctional and Stimuli Responsive Surfaces for Biotechnology
- Nanoporous Membranes for Sensing, Filtering, and Optical Applications

"BioMEMS:

- BioMEMS devices for Cell Studies
- Microfabricated Tools for Nanotoxicology and Pharmacology
- Improved Implant Surfaces for Optimized Cell Interactions
- Electrical Measurements of Cell Growth and Health

"Scanning Probe Methods (SPMs):

- Parallel Cell Probing for Cell Array Assays
- Mechanical Probing of Cells for Cancer Research
- Microarray Fabrication by Attoliter Dispensing
- Microinjection into Living Cells

"High Sensitivity Optical Biosensing:

- Functional Surfaces for Selective Sensing
- Biosensor Integration and Lab-on-a-Chip
- Wearable Sensing Solutions in Textiles
- Applications for Food Safety, Security, Healthcare and Diagnostics

With about 20 running project every years, CSEM has proven to be a reliable partner.

Intellectual Property Rights:

Others

Application Domains:

Materials technology; BIOLOGICAL SCIENCES

Comments about market applications:

In the field of Nanotechnology the main activities of CSEM are in Nanotools and Nanostructuring. Nanotools are advanced Local Probes as multiple AFM probes on a single wafer as well as AFM probes with special features (e.g. AFM probes with holes that allow nanodispensing). Nanostructuring can be seen as bottom-up (e.g. self-structuring, for instance for special surface properties) and top-down (by using traditional microtechnology systems as for instance embossing of periodical structures with nanometric periodicity, for security and traceability applications).

Collaboration Details:

Technical co-operation:

Type of partner sought:

In terms of European Commission project CSEM is committed to bring value to consortia bringing disruptive innovation, which can create industrial value.

Network partner

Alliance EPFL

Switzerland

CSEM Centre Suisse d'Electronique et de Microtechnique SA

Sectors: Applied Research, Product Development, Prototype and Low-volume Production, Technology Consulting

Activities: The main fields of activity are micro- and nanotechnologies, microelectronics, systems engineering, microrobotics, photonics, information and communication technologies.

Technology keywords: Chemical Technology and Engineering; Environment; Materials Technology; Micro- and Nanotechnology related to Biological sciences; Micro- and Nanotechnology related to physical and exact sciences; Nanotechnologies related to electronics and microelectronic

Technology Offer

TO_CH_27444

Title: R&D services and small series production in Microsystems, Nanotechnology, Microelectronics, ICT and System Engineering

Abstract: CSEM, the Swiss Center for Electronics and Microtechnology, Inc., is a privately held research and development company active in:

Applied Research
Product Development
Prototype and Low-volume Production
Technology Consulting

Its main fields of activity are micro- and nanotechnologies, microelectronics, systems engineering, microrobotics, photonics, information and communication technologies.

In providing its high-tech know-how and technological expertise, CSEM strives to anticipate the future needs of different markets in terms of new technologies and offers its services to industrial customers. It also develops its own commercial activities _ either together with existing companies or through the creation of spin-offs and start-up companies _ and actively contributes to developing Switzerland as a high-tech industrial location.

Detailed description: As technology provider in bilateral projects. Main focus is on developing new products on the basis of technology platforms. CSEM being a fast (in terms of execution) flexible (in terms of business relation and IP management) and professional (in terms of project management and technological excellence) is the ideal partner of the industry for efficient product development.

CSEM participates frequently in EC funded projects, that target to collaborative research. It excels in the fields of MEMS / NEMS, Nanotechnology, Advanced Signal processing and wireless communications. With about 20 running project every years, CSEM has proven to be a reliable partner.

Intellectual Property Rights: Others

Application Domains: Industrial manufacture; Materials technology; Chemical industry; BIOLOGICAL SCIENCES; ENVIRONMENT

Comments about market applications: In the field of Nanotechnology the main activities of CSEM are in Nanotools and Nanostructuring. Nanotools are advanced Local Probes as multiple AFM probes on a single wafer as well as AFM probes with special features (e.g.

AFM probes with holes that allow nanodispensing). Nanostructuring can be seen as bottom-up (e.g. self-structuring, for instance for special surface properties) and top-down (by using traditional microtechnology systems as for instance embossing of periodical structures with nanometric periodicity, for security and traceability applications).

In the field of Microsystems CSEM disposed one of the most advanced labs in Europe, able to produce in small scales complex structures as gears for the watch industry. Beyond this, CSEM is very active in MOEMS (e.g. for new types of tunable optical gratings) and in biosensors.

Particular attention is dedicated to the convergence of Nano to Bio, for instance by producing unique membranes with nanoscopic features applicable in bio applications. Nanomedicine is the most straightforward application.

Real world integration is facilitated by using dedicated microelectronics with low power digital signal processing and wireless communication capability. Algorithmics and protocol are the system level capabilities that complement the technology capabilities of the company.

Collaboration Details: Licence agreement: Technical co-operation: Commercial agreement with technical assistance:

Type of partner sought: In term of industrial partnership CSEM has customers that range from the start-up range to the blue-chip range. Main partners are companies willing to outsource part of their R&D in order to profit from own existing technology platforms and therefore accelerate time to market.

In terms of European Commission project CSEM is committed to bring value to consortia bringing disruptive innovation, which can create industrial value.

Network partner Alliance EPFL

Netherlands

Enterprise Europe Network NL - Syntens

Sectors: industry

Activities: innovation-consultancy

Technology keywords: Micro- and Nanotechnology related to physical and exact sciences;
Nanotechnologies related to electronics and microelectronics

■ Partner Search

PS_NL_27329

Title: High-performance positioning actuator.

Abstract: A Dutch engineering group developed an actuator according to high-end specifications for adjusting segmented mirrors for large telescopes. The actuator is capable of positioning large masses of some hundreds of kilos with nanometre accuracy in a range of tens of millimetres with high static load. The company is looking for a technical cooperation with companies or astronomic institutes that are searching for solutions for their positioning demands.

Detailed description: In the field of astronomy there is a never-ending urge for larger telescopes with increasing light sensitivity. The primary mirror cannot be manufactured as one optical piece but has to be made of several segments, which all have to be adjusted with respect to each other on nanometre scale. For this purpose an actuator concept has been developed according to high-end specifications.

Completely sealed, play-free and frictionless construction combining high accuracy with long stroke and high force.

A completely sealed system makes it insensitive for the environment and benefits lifetime. This actuator has the following advantages:

- Nanometre resolution
- Stroke: 20 mm.
- Play-free, extremely low hysteresis
- Actuating force: 0 to 2000 N
- Completely sealed
- Integrated electronics and motion control

Intellectual Property Rights: Patent(s) applied for but not yet granted

Application Domains: Industrial manufacture
Comments about market applications: Astronomic institutes and mirror applications.
Semiconductor-industry.

Collaboration Details: Technical co-operation:

Type of partner sought: The company is looking for technical cooperation with astronomic institutes and companies that are interested in using or integrating the actuator in their system. The position actuator is specially designed for segmented mirror applications but can also be tailored to other applications where accurate and stable position should be maintained.

Network partner Stichting Syntens, Innovatienetwerk Voor Ondernemers

Netherlands Enterprise Europe Network NL - Syntens

Sectors: industry

Activities: innovation-consultancy

Technology keywords: Materials Technology; Nanotechnologies related to electronics and microelectronics

■ Technology Offer

TO_NL_27325

Title: Nanocoatings for transparent film & sheet applications in display, window and protective applications.

Abstract: A Dutch SME is specialised in development and production of nanodispersions and coatings thereof. The focus of the business development is in optical coatings for transparent sheet and films. Applications are in the field of touch panel films, protective films, heat absorbing films and antistatic films and sheets. The company is interested in commercial supply agreements with optionally technical development programs.

Detailed description: Nanotechnologies and nanomaterials are in high interest for their superior optical, electrical, mechanical and catalytic properties. However, for optimal use of nanomaterials tailoring of the particle, binder and material processing to the final application is essential to obtain commercially viable results. The Dutch company has the unique capability to develop and produce on a commercial scale tailored dispersions for high/end applications. The nanodispersions offered have been in commercial use for more than a decade in the electronics market.

The Dutch company focuses on doped metaloxide dispersions for the optical film and sheet business. The key advantage is to tailor the dispersions to the application in cooperation with the film or sheet converter. Standard products are available, but upon agreement these can be adapted to specific customer requests.

The quality of the nanodispersions has met the market demands for high-end optical coating applications for more than a decade. In the last few years the company has combined this quality with flexibility and creativity of a SME company. The result is a high product development potential and high speed for commercialisation. This gives a strong advantage to the film or sheet end-user.

Intellectual Property Rights: Secret know-how

Application Domains: Industrial manufacture; Materials technology; Chemical industry

Comments about market applications: The company is currently supplying film and sheet converters in the field of touch panel films, hard-coated films and antistatic films. A strong growth market are clear heat-absorbing films which provide protection against the solar heat while having a high visual transparency.

Collaboration Details: Technical co-operation:

Type of partner sought: - Type of partner sought: industry
- Specific area of activity of the partner: in particular film&sheet coaters or converters

The tasks to be performed: the Dutch company will provide technical assistance within the framework of commercial agreements. The main task of the company sought is to give insights to possible market applications. A future collaboration has to lead to new market applications.

Network partner

Stichting Syntens, Innovatienetwerk Voor Ondernemers

Netherlands

Enterprise Europe Network NL - Syntens

Sectors: industry

Activities: innovation-consultancy

Technology keywords: Micro- and Nanotechnology related to physical and exact sciences;
Nanotechnologies related to electronics and microelectronics

Technology Offer

TO_NL_27326

Title: Zero Drift Positioning Stage

Abstract: A Dutch engineering group developed a positioning stage that is able to position substrates in the nanometre range, with sub-nanometre stability after positioning has taken place. The high position stability is created by excluding all actuator forces on the substrate holder and creating a fixed position with respect to the frame. The company is looking for a technical cooperation with companies or research institutes looking for positioning solutions with high stability.

Detailed description: For accurate positioning where also high stability is required for instance in electron beam or ion beam microscopy the Zero Drift Positioning Stage can be a solution.

The piezo-electric driven stage is capable of moving in a horizontal plane in limited space under vacuum conditions.

It has been designed in such a way that after reaching the desired position the stage will be mechanically locked to the frame for high stability, without affecting the reached position.

It can be equipped with an integrated measuring system in order to monitor the reached position.

The concept can be tailored to specific demands.

High stability in sub-nanometre range in short term after positioning has taken place.

The system will dissipate no power after positioning and is well suited for vacuum as well as cryogenic applications.

This stage has the following advantages:

- Nanometre resolution
- Stroke: several millimetres
- Stability: sub-nanometre
- Vacuum-compatible
- Cryogenic-compatible

Intellectual Property Rights: Patent(s) applied for but not yet granted

Application Domains: Industrial manufacture

Comments about market applications: Substrate positioning for electron-microscopes.

Optical element position adjustment in vacuum or cryogenic environments.

Collaboration Details: Technical co-operation:

Type of partner sought: The company is looking for research companies looking for positioning solutions with high stability. The positioning stage can be tailored to special requirements.



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Network partner

Stichting Syntens, Innovatienetwerk Voor Ondernemers

Netherlands

Enterprise Europe Network NL - Syntens

Sectors: industry

Activities: innovation-consultancy

Technology keywords: Micro- and Nanotechnology related to physical and exact sciences;
Nanotechnologies related to electronics and microelectronics

■ Technology Offer

TO_NL_27330

Title: Piezo-driven stage with high accuracy and stability for positioning up to six degrees of freedom

Abstract: A Dutch engineering group has developed a piezo-driven positioning stage. The stage is closed-loop-controlled and can be positioned in 6 degrees of freedom with sub-nanometre resolution, high accuracy and stability, and a range of several tens of microns. The stage can be used in combination with a large-stroke stage for highly frequent position error correction. The company is looking for a commercial agreement with technical assistance with companies in the field of micro/nano positioning.

Detailed description: The positioning stage developed by a Dutch company can be closed-loop-positioned in six degrees of freedom with a sub-nanometre resolution and high accuracy and stability. The range of movement is several tens of microns. Unlike other competitive stages, the suspension and drive functionality are integrated resulting in a high natural frequency (bandwidth > 200 Hz, load 5 kg) and low hysteresis and cross talk. The stage is supported and driven by three identical modules, which implies flexibility with respect to layout. Six integrated capacitive sensors perform the position measurement for the closed-loop control.

The stage is piezo-driven and made of non-magnetic materials, which makes it suitable for electron optical applications, or applications with charged particles in general. The used materials are also vacuum-compatible; it is possible to use the stage in an ultra high vacuum environment. By definition, the positioning of the stage is not affected by thermal influences due to its geometric layout.

Unlike other competitive stages, the suspension and drive functionality are integrated, resulting in a high natural frequency (bandwidth > 200 Hz, load 5 kg) and low hysteresis and cross talk. The stage is supported and driven by three identical modules, which implies flexibility with respect to layout. Six integrated capacitive sensors perform the position measurement for the closed-loop control.

Positioning in six degrees of freedom, sub-nanometre resolution, high bandwidth of > 200Hz with load of 5 kg. Play-free, extremely low hysteresis, symmetric layout results in temperature stability, large aperture, UHV (ultra high vacuum)-compatible, and non-magnetic materials.

Intellectual Property Rights: Patent(s) applied for but not yet granted

Application Domains: Industrial manufacture

Comments about market applications: The applications of the positioning stage can mainly be found in the semiconductor, space and biotechnology industry. The stage can be used for positioning, error correction.

Collaboration Details: Technical co-operation: Commercial agreement with technical assistance:

Type of partner sought: The company is looking for a commercial agreement with technical assistance or technical cooperation with OEM companies that want to integrate the positioning stage in their product, or research institutes that want to make use of the stage by integrating it in their test set-up. The company is able to give training and to tailor the design to specific needs.

Network partner Stichting Syntens, Innovatienetwerk Voor Ondernemers

Germany

Forschungszentrum Karlsruhe GmbH

Technology keywords: Industrial Manufacture; Materials Technology; Micro- and Nanotechnology related to Biological sciences; Micro- and Nanotechnology related to physical and exact sciences; Nanotechnologies related to electronics and microelectronics

Technology Offer

TO_DE_27451

Title: EUMINAFab A European research infrastructure for micro and nano fabrication

Abstract: EUMINAFab is a European research infrastructure for micro-nano fabrication of functional structures and devices out of a knowledge-based multimaterials_ repertoire.

The Consortium of 10 partners offers access to 36 installations with the necessary technical support personnel in the areas of micro and nano patterning, thin film deposition, replication and characterisation. Access is possible by written proposal submission through the EUMINAFab Entry Point which will be shortly available on the project web page www.euminafab.eu.

EC funding covers the costs of access and transport and accommodation costs for EUMINAFab_s users, regardless whether from both academia or industry, upon condition that the results can be publically available.

EUMINAFab Partners are Forschungszentrum Karlsruhe, Cardiff University, CEA-Liten, CRF Fiat, TEKNIKER, Philips MiPlaza, Fraunhofer IPA, KTH, IMS-Nano, NPL,

Detailed description: 36 installations are available at 8 partner sites offering no-fee access to the following technologies:

Micro-nano patterning:

Electron beam, E-beam & SCIL, Ion beam (Focussed cross beam), Ion beam (parallelized ion beams), DPN, Direct X-ray litho, Laser technologies (e.g. ps, fs, surface texturation), Mechanical μ ma-chining (freeform), Mastermaking process chain, DRIE (Si, glass, SiO₂)

Thin film deposition:

PVD technologies (e.g. noble metals, DLC, nanocomposi-tes, metals, nitrides), Org. PVD (e.g. organic liquids & powders,oxides), CVD (metals, polymers, ceramics), Photopolymerisation process, Self Assembly (e.g. semiconductors, organic),

Screen printing (e.g. metals, dielectrics)

Replication:

μ injection moulding (e.g. polymers, metals, ceramics; small series), μ hot embossing (small series), Thermal imprinting & UV-NIL, NIL process chain (UV photolitho, dry & wet etching)

Characterisation:

HRTEM, XPEEM, Auger Nanoprobe, In situ synchrotron X-ray diffractometry (> 2010)

AFM, conductive AFM, Spectrophotometry /-radiometry, profilometry (e.g. low force contact mode & white light mode), μ CMM, Low force balance, ellipsometry

Intellectual Property Rights: Others

Application Domains: Industrial manufacture; Materials technology

Collaboration Details: Technical co-operation:

Type of partner sought: The technology offer is open to researchers and developers from academia

and industry requiring access to technologies in the area of micro and nano patterning, thin film deposition, replication and characterisation.

Network partner

Wirtschaftsministerium Baden-Württemberg

Spain

Fundación LEIA CDT

Sectors: research
 Activities: research
 Technology keywords: Industrial Manufacture

■ Know-how/ expertise

KHE_ES_27465

Title: Study of the impact of nanotechnology in health and safety

Abstract: LEIA (<http://www.leia.es>) is a private non-profit Research & Development Centre. The Industrial Safety Unit (LEIA-UDS) is currently involved in a strategic research line focused on nanotechnologies and its impact on health and safety. The centre has great experience in the management and development of both, European and National projects. LEIA is member of the executive board of the European Technology Platform on Industrial Safety (ETPIS) and the Spanish one (PESI).

Detailed description: LEIA offers its knowledge and capabilities in the research on the impact of nanotechnology in health and safety and more specifically, in occupational scenarios. We may collaborate in applications where manipulates nanomaterials, and where health and safety impacts should be considered.

LEIA-UDS has great experience in industrial safety and occupational health and safety. The centre has recently initiated a strategic research line addressed to study the health and safety impacts of engineering nanoparticles (ENPs). His capabilities are focused to: (1) evaluate the exposure to ENPs in the workplace, (2) study the efficiency of control/prevention devices, (3) risk management of this emergency risk, and (4) evaluate toxicity of ENPs (genotoxicity).

The Centre is doted with hygienic labs, environmental emissions labs and nowadays is setting up a specific lab addressed to study nanoparticles and safety.

Intellectual Property Rights: Others

Application Domains: Industrial manufacture
Comments about market applications: Applications where manipulates nanomaterials, and where health and safety impacts should be considered

Collaboration Details: Technical co-operation:

Type of partner sought: Partners with applications where manipulates nanomaterials, and where health and safety impacts should be considered

Network partner Sociedad Para La Promoción Y Reconversión Industrial

CZECH REPUBLIC LIFETECH s.r.o.

Sectors: Manufacturing of electrical devices; Applied research

Activities: Manufacturing of ozone generators and UV reactors; Water and air treatment

Technology keywords: Environment; Materials Technology; Micro- and Nanotechnology related to physical and exact sciences; Waste Management

Technology Request

TR_CZ_27159

Title: Request for nanomaterials as TiO₂ that could be used in advanced oxidation processes.

Abstract: Manufacturing of ozone generators and UV reactors. Ozone generators with output range from milligrams to tens of kilograms ozone per hour. UV reactors equipped with low or medium pressure UV lamps. Application to water and air treatment. Service of the equipment.

Detailed description: LIFETECH produces equipment that is used in advanced oxidation processes based on ozone/UV, ozone/hydrogen peroxide or UV/hydrogen peroxide applications. Further enhancement in this area can be obtained by application of nanomaterials as, e.g. TiO₂ photocatalysator. We are also interested in antimicrobial properties of nanomaterials and in the possibility of their usage in combination with different processes (low-temperature plasma application etc.).

Intellectual Property Rights: Others

Application Domains: Materials technology; ENVIRONMENT; Environment protection

Comments about market applications: Water and air treatment
Environment protection
Research and development

Collaboration Details: Technical co-operation:

Type of partner sought: SME
active in production/application of nanomaterials
engineering company

Network partner BIC Plzen - Business and Innovation Centre

Italy

MBN Nanomaterialia Spa

Sectors: nanophased materials for diamond tool industry, automotive, aerospace industry, biomedical application, energy

Activities: Production of nanophased materials, research

Technology keywords: Energy storage and transport; Materials Technology

■ Partner Search

PS_IT_27559

Title: Industrial applications of advanced nanostructured materials

Abstract: MBN's core business is focused on production of nanophased powder materials on industrial scale (200ton/year) by proprietary Mechanomade® process (high energy ball milling base technology). The following products are already on the market: Fe-Cu alloys for diamond grinding tools, WC-Co thermal spraying powders for extreme wear resistance, Ti base biomedical alloys, Mg and Ni-MH base material for energy storage, nanopolymers for water proof textile membrane. MBN's mission is also focused on continuous R&D of innovative materials as: high performance alloys developed for aeronautics (steel and Ni base), nanomaterials for laser sintering rapid manufacturing (metal and polymer nanocomposites), light alloys for the automotive field.

Detailed description: Several case studies demonstrate that nanophased materials can improve functionalities and performances of many products in different fields: aeronautics, rapid prototyping, automotive, materials for energy, textile. To preserve as much as possible the outstanding properties of MBN's nanostructured powder materials, during the consolidation/deposition it is necessary to expose powders to high temperature only for a minimum of time. A partner offering one of the following technologies is requested:

- Spraying technology (i.e. HVOF, plasma, cold etc) for nanophased aggregated powders deposition;
- consolidation/sintering of nanopowders (i.e. Spark Plasma Sintering, MIM, SLM, SLS etc).

Intellectual Property Rights: Others

Application Domains: Industrial manufacture; Materials technology; ENERGY
Comments about market applications: nanophased materials, nanosurfaces deposition, Nano micro-manufacturing, nano-micro-macro integration

Type of partner sought: Expected partners:

- SME, large industries with activities/know how focused on integration of nanophased powder into micro-macro systems (surfaces engineering, consolidation of 3D structures, micro nano manufacturing).
- Engineering company able to model/design innovative materials for targeted applications.
- SME, large industries as end users for the proposed technology (mechanical alloyed nanophased powders+ spraying and/or consolidation) in different fields: aeronautics, automotive, microengineering (mechanical components and tools, biomedical products), energy storage, textile manufacturing (polymers base nanoalloys).

Network partner Veneto Innovazione S.P.A

Italy

MBN Nanomaterialia Spa

Sectors: nanophased materials for diamond tool industry, automotive, aerospace industry, biomedical application, energy

Activities: Production of nanophased materials, research

Technology keywords: Energy storage and transport; Industrial Manufacture; Materials Technology

Technology Offer

TO_IT_27560

Title: Nanostructured powders for energy storage, laser sintering rapid manufacturing, biomedical applications and aeronautics components.

Abstract: MBN Nanomaterialia was founded on 1994. MBN's core business is focused on production of nanophased powder materials on industrial scale (200ton/year) by proprietary Mechanomade® process (high energy ball milling base technology).
The following products are already on the market: Fe-Cu alloys for diamond grinding tools, WC-Co thermal spraying powders for extreme wear resistance, Ti base biomedical alloys, Mg and Ni-MH base material for energy storage, nanopolymers for water proof textile membrane.
MBN's mission is also focused on continuous R&D of innovative materials as: high performance alloys developed for aeronautics (steel and Ni base), nanomaterials for laser sintering rapid manufacturing (metal and polymer nanocomposites), light alloys for the automotive field.

Detailed description: MBN's production capacity is 200ton/year. Typical output of MBN's process is constituted by nanocrystals and nanoparticles (i.e. <100nm) aggregated in micron-size range powders (i.e. 5-100µm).
Thanks to the flexibility of the process it is possible to produce nanomaterials pertaining both to inorganic and organic field like: Fe-Cu alloys for diamond grinding tools, WC-Co thermal spraying powders for extreme wear resistance, Ti base biomedical alloys, Mg and Ni-MH base material for H2 and energy storage, nanopolymers for water proof textile membrane, high performance alloys developed for aeronautics (steel and Ni base), nanomaterials for laser sintering rapid manufacturing (metal and polymer nanocomposites), light alloys for the automotive field.
MBN is available for both research and industrial collaboration.

Intellectual Property Rights: Others

Application Domains: Industrial manufacture; Materials technology; ENERGY
Comments about market applications: powder metallurgy, nanophased materials consolidation, nanosurfaces deposition, Nano micro-manufacturing

Collaboration Details: Technical co-operation:

Type of partner sought: SMEs, large industries with activities/know how focused on integration of nanophased powder into micro-macro systems (surfaces engineering, consolidation of 3D structures, micro nano manufacturing).
End users in different fields: aeronautics, automotive, microengineering (mechanical components and tools, biomedical products), energy storage, textile manufacturing

Network partner Veneto Innovazione S.P.A

Spain

nanoBasque Agency

Sectors:	Public Agency Public Agency for business development and support to
Activities:	Coordination of the development of the nanoBasque Strategy, which mainly translates into providing support for micro and nanotechnology enabled business development in the Basque Country
Technology keywords:	Chemical Technology and Engineering; Energy production, transmission and conversion; Energy storage and transport; Environment; Fossil Energy Sources; Industrial Manufacture; Materials Technology; Micro- and Nanotechnology related to Biological sciences;

■ Know-how/ expertise

KHE_ES_27456

Title:	Basque Contact Point for micro and nanotechnologies
Abstract:	Coordination of the development of the nanoBasque Strategy, which mainly translates into providing support for micro and nanotechnology enabled business development in the Basque Country.
Detailed description:	The nanoBasque Agency is a Public Agent for business development and support to industry related to micro and nanotechnology in the Basque Country. The nanoBasque Agency belongs to SPRI - Basque Development Agency for Industry in the Basque Country (Spain), which is one partner of EEN. The nanoBasque Agency is the instrument created to implement the nanoBasque Strategy. It strives to boost Basque companies and research agents' presence in international initiatives and markets.
Intellectual Property Rights:	Others
Application Domains:	Industrial manufacture; Materials technology; Chemical industry; ENERGY; BIOLOGICAL SCIENCES; ENVIRONMENT; Environment protection
Collaboration Details:	Technical co-operation:
Type of partner sought:	Any partner that is willing to establish either business or R&D activities/collaboration/ventures with Basque partners.
Network partner	Sociedad Para La Promoción Y Reconversión Industrial

Sweden

Nanologica

Sectors: Healthcare, Energy
Activities: Materials development and commercialisation
Technology keywords: Materials Technology

Technology Offer

TO_SE_27445

Title: Mesoporous materials for drug delivery.

Abstract: Nanologica is a leading Swedish materials development company - structured around its two major business sections: NLAB Bio and NLAB Energy. NLAB Energy is developing new materials with applications in the renewable energy sector and NLAB Bio is focusing on materials with applications in diagnostics and drug delivery

Detailed description: Nanologica has developed mesoporous metaloxide materials for drug delivery. The materials provide a controlled release over a prolonged period of time (Up to 3 months), and the materials offer a superbe delivery vehicle for non-soluble drugs. Tox tested both in vitro and in vivo.

Intellectual Property Rights: Patent (s) granted

Application Domains: BIOLOGICAL SCIENCES
Comments about market applications: Drug Delivery

Collaboration Details: Licence agreement: Joint Venture agreement: Commercial agreement
with technical assistance: Financial resources:

Network partner Acreo Ab

Spain

NanomedSpain-UII

Sectors: Health, BioMedicine, Biotechnology, Pharmaceutical
 Activities: R+D+i, Knowledge Transfer,
 Technology keywords: Materials Technology; Micro- and Nanotechnology related to Biological

■ Know-how/ expertise

KHE_ES_27603

Title: Partners prospect

Abstract: The biomedical and biotechnological industrial sectors play the leading role in NanomedSpain, very actively supported by technology centres, research organisations, universities and hospitals, as well as by the Spanish public administration. The biomedical and biotechnological industrial sectors play the leading role in NanomedSpain, very actively supported by technology centres, research organisations, universities and hospitals, as well as by the Spanish public administration.

Detailed description: The main objective of the International Innovation Unit is to increase the participation in FP7 of companies, research centres, technology centres and hospitals that are members of NanomedSpain, and more generally of those active in the biomedical and biotechnological Spanish sectors. Our activities relate to the development of quality proposals particularly focused on relevant subprogrammes (i.e. Health, KBBE, ICT, NMP).

Intellectual Property Rights: Others

Application Domains: Materials technology; BIOLOGICAL SCIENCES
Comments about market applications: Biomedical, Biotechnological

Collaboration Details: Technical co-operation:

Network partner NO

ARGENTINA

Nanotec Latina SH

Sectors:	Brokerage
Activities:	Representation in Latin America
Technology keywords:	Chemical Technology and Engineering; Energy production, transmission and conversion; Energy storage and transport; Environment; Fossil Energy Sources; Industrial Manufacture; Materials Technology; Micro- and Nanotechnology related to Biological sciences;

■ Technology Request

TR_AR_27338

Title:	New nanotechnologies for market in Latin America
Abstract:	<p>We have created in Buenos Aires, Argentina, Nanotec Latina S.H., a company that represent worldwide Companies in two key markets: Latin America and the U.S.A., without boundaries.</p> <p>Nanotec Latina S.H. is a demand-driven and import-oriented brokerage company, aimed at making future and existing ideas and products available to consumers throughout the mentioned markets. Please see our webpage: www.nanoteclatina.com</p> <p>Through our website www.nanoteclatina.com , with e-marketing, and outside sellers crew, we make contact with scientists, professionals, entrepreneurs and company's executives spanish speakers in Latin America, offering them the companie's products in spanish languge. (because our webpage is for Latin America's spanish speakers).</p>
Detailed description:	We are looking for nanotechnology_s products already on sale in the market to represent in Latin America.
Intellectual Property Rights:	Others
Application Domains:	Industrial manufacture; Materials technology; Chemical industry; ENERGY; BIOLOGICAL SCIENCES; ENVIRONMENT; Environment protection
Collaboration Details:	Commercial agreement with technical assistance:
Network partner	BIC Plzen - Business and Innovation Centre

Greece

Nanothinx SA

Sectors: Nanomaterials, nanotechnology, specialised chemicals

Activities: Production of high purity low cost carbon nanotubes and their applications

Technology keywords: Micro- and Nanotechnology related to physical and exact sciences;
Nanotechnologies related to electronics and microelectronics

Technology Offer

TO_GR_27453

Title: Production and applications of High-Purity and Low-Cost Carbon Nanotubes

Abstract: A high technology spin-off enterprise founded in 2005. Its activities mainly lie on the development of methods for the large-scale, high-yield and low-cost production of carbon nanotubes (CNT), using novel nanostructured catalysts on suitable supports. The proprietary methods of nanotubes production used by NTX are based on the catalytic chemical vapor deposition of carbon (CCVD or CVD) from hydrocarbon feeds using metallic catalysts on suitable supports. Main products are as-prepared multi-wall carbon nanotubes (MWNT) of various purities, thin multi-wall carbon nanotube, single-wall carbon nanotubes (SWNT) as well as functionalized carbon nanotubes and aqueous CNT dispersions.

Detailed description: A high-tech SME company, spin off of a major Chemical Engineering research Institute, established in November 2005, which specialises in the development and large-scale production of high-purity and low-cost carbon nanotubes (CNTs), as well as on some of their applications produces the highest _as produced_ nanotube purity (98.5% for multi wall nanotubes) at production cost which is a fraction of that of the competition. This is achieved by exploiting the proprietary production method and catalysts, specially developed by the research team of the company.
More specifically, the product range of the company is divided into two categories:

- High purity carbon nanotubes.

Its evolution as a company is heavily dependent on the continuous process of developing new specialised nanotube products to be used in specific applications. The technique of catalytic chemical vapor deposition (CCVD or CVD) is employed for the CNT production. The company, after having developed a basic array of nanotube products, produces nanotubes on demand based on the characteristics requested by the clients.

- Realisation of nanotubes application

The company offers consulting services for the incorporation of nanotubes in materials in order to exploit their special characteristics (mechanical, electrical, thermal properties). The integration of carbon nanotubes involves complex procedures. Until today the research team of the company has developed expertise in the integration of carbon nanotubes in polymers, resins, ceramics and other materials. Nanothinx has contacted research for several clients having developed special proprietary methods.

The nanotubes offered by the company are:

a. Pristine multi-wall carbon nanotubes (MWNT) of various purities (91-98.5%)

The diameters range between 10 and 40 nm, depending on the purity and the length of the nanotubes is longer than 10 µm.

b. High-purity (>90%) pristine thin multi-wall carbon nanotubes (TH-MWNT). The diameters of these nanotubes range from 6-10 nm and their length is

longer than 10 µm.

c. Pristine (60-65%) and purified (85%) single-wall carbon nanotubes (SWNT)
The diameters of SWNT vary from 0.8 to 1.5 nm, and their length is higher than 5 µm.

The company has also developed different CNT forms in order to facilitate the

integration of nanotubes in customer's materials:

- a. CNT with functional groups (e.g., COOH, NH₂)
- b. CNT in the form of aqueous solutions

The research team of the company is currently working on the development and optimization of other types of nanotubes:

- a. MWNT of 99% purity
- b. Aligned multi-wall carbon nanotubes (MWNT arrays). This category of nanotubes will enable their integration to polymeric or ceramic matrices with a specific orientation and also provide for longer nanotubes.
- c. Double-wall carbon nanotubes (DWNT).

Intellectual Property Rights:

Patent (s) granted

**Application Domains:
Comments about market
applications:**

Industrial manufacture; Materials technology; Chemical industry
MWNT exhibit unique mechanical properties and can, therefore, be used in high-strength applications for increasing tensile strength and modulus of nanocomposites. These applications include automotive & aerospace materials, plastics (e.g., for packaging), and fabrics for construction materials. Thin multi-wall carbon nanotubes also exhibit very good mechanical properties, while their small diameters allow their use in applications where high electrical conductivity is required, such as sensors and electronic circuits (e.g., interconnects).
SWNT have also semiconductive characteristics, which enables their use in microelectronic applications.
Carbon nanotubes can also be used in other fields, such as energy (fuel cells, hydrogen storage, batteries) and biomedicine (biosensors, drug delivery & release,).

Collaboration Details:

Licence agreement: Technical co-operation: Commercial agreement with technical assistance:

Type of partner sought:

Mainly industrial partners (SMEs, large companies), but the other types of partners (research centers, universities) are also welcome.

The partner(s) should be active in one of the following activities:

- Polymer &, Plastics
- Composites/nanocomposites (e.g., adhesives)
- Manufacturing of Automotive & Aerospace parts, and Transport fields in general
- Energy application, with emphasis on fuel cells

These partners should need R&D or manufacturing consulting for development of CNT-based products with improved mechanical and/or electrical and/or thermal properties.

The tasks to be performed by the partner sought

- Co-development of CNT-based products. For example, preparation of a resin composite reinforced with carbon nanotubes for attainment of enhanced mechanical performance for use in aerospace parts.

Network partner

Foundation For Research And Technology Hellas

CZECH REPUBLIC NanoTrade, s.r.o.

Sectors: nanotechnology R&D and commercial applications

Technology keywords: Chemical Technology and Engineering; Energy production, transmission and conversion; Energy storage and transport; Environment; Industrial Manufacture; Materials Technology; Renewable Sources of Energy

Partner Search

PS_CZ_27383

Title: Industrial applications

Abstract: NanoTrade is a leading Czech company in the field of nanotechnology R&D and its commercial application. Since 2004 NanoTrade have realised technology projects for textile, paper and plastic producers, and managed and implemented several projects. NanoTrade has an excellent technical background, knowledge and experience. It also has strong links with Czech Universities and frequent cooperation with research institutes in the Czech Republic, Poland, Austria, Germany, UK, USA and Singapore. NanoTrade provides testing and development of new materials, technologies and applications in the nanotechnology field. It also produces new nanomaterials. Furthermore, NanoTrade analyses, defines and prepares projects and production programs, relevant marketing, consultation services and trading activity in nanotechnology products. Furthermore, NanoTrade organises technical seminars for experts from R&D, OEMs and manufacturers. NanoTrade is also a co-founder of the Czech Nanotechnology Cluster in Olomouc and member of CSNMT. and member of CSNMT (the Czech Association for new Materials and Technology) and brings these links to the project.

Detailed description: NanoTrade is also seeking for practical nanotechnology R&D applications especially for plastic, paper, wood, paint, mechanical engineering which are prepared for transfer or licensing. High value added and high productivity applications are preferred only.

We offer our technology, marketing, market knowledge and production experience for antibacterial, surface treatment and energy savings Research 7.FP as a partner. Type of program is open to discussion.

Intellectual Property Rights: Others

Application Domains: Industrial manufacture; Materials technology; Chemical industry; ENERGY; ENVIRONMENT

Collaboration Details: Licence agreement: Technical co-operation: Commercial agreement with technical assistance:

Network partner BIC Plzen - Business and Innovation Centre

Ireland

National Centre for Sensor Research

Activities: Nano-Micro-Bio Materials Convergence, Sensor Technology, Manufacturing Technologies

Technology keywords: Environment; Industrial Manufacture; Materials Technology; Micro- and Nanotechnology related to physical and exact sciences; Nanotechnologies related to electronics and microelectronics

Technology Offer

TO_IE_27355

Title: National Centre for Sensor Research

Abstract: The National Centre for Sensor Research (www.ncsr.ie) is capable of offering materials for sensing technologies for a host of applications including sensor technologies.

Detailed description: We are a world renowned, large-scale, multidisciplinary research facility focused on the science and applications of chemical sensors and biosensors. The membership includes over 80 senior researchers and almost 120 post-graduate students. A key feature of the NCSR is the multidisciplinary composition of the research team, which includes physicists, chemists, biotechnologists and engineers.

The NCSR is based in ca. 3,200 sq meter custom-designed buildings with clean-rooms, synthetic and biohazard facilities, application-specific project laboratories and support units.

The research programme of the NCSR includes both fundamental and applied projects, ranging from basic studies of molecular interactions to prototype development for industrial partners.

NCSR is focused on developing future sensing technologies for economic and societal benefit for application in personal health monitoring and diagnostics, environmental monitoring, (bio) process optimization and nano/bio-medicine.

NCSR has prioritized research in the areas of:

- * Fundamental Materials Science: Nano-Micro-Bio Materials Convergence
- * Environment (Monitoring) Technologies
- * Nanomedicine

In turn, these areas are underpinned by the core competencies of the centre:

- * Photonics
- * Biomolecular Interactions
- * Surface and Interface Science
- * Separations Science
- * Functional and Switchable Materials
- * Biosensors
- * Nanomaterials Science
- * Electrochemical Sensors
- * Microsystems Fabrication

Intellectual Property Rights: Patent(s) applied for but not yet granted

Application Domains: Industrial manufacture; Materials technology
Network partner Enterprise Ireland

Netherlands NovioNano BV

Technology keywords: Chemical Technology and Engineering; Environment; Industrial Manufacture; Materials Technology; Micro- and Nanotechnology related to Biological sciences; Micro- and Nanotechnology related to physical and exact sciences

■ Know-how/ expertise

KHE_NL_27557

Title: Risk assessment and management: consulting and analytical services (biological & toxicological behaviour and fate of nanoproducts)

Abstract: A Dutch SME company is specialised in understanding the biological and toxicological behaviour and fate of nano products: hazard identification. Obtaining data on potential hazard and exposure are the corner stone_s for risk management. NovioNano provides analytical services and consulting enabling our customers to manage risk.

For the analyses of the nano products NovioNano uses proprietary in vitro and ex vivo cellular assays and specific monitoring assays such as oxidative stress measurement and cardio toxicity. NovioNano is looking for new assays, methods and apparatus to analyze new and existing endpoints and exposure measurement methods.

Detailed description: NovioNano provides its customers with hands on support and high quality, scientifically validated, analytical data:
 " Best practice risk management table: NovioNano designed a multi step action plan to characterize and manage risk dedicated to nanoproducts on the work floor
 " Extensive physical chemical analyses and characterization of nano products
 " Bio analyses of nano products using in vitro and ex vivo cellular assays and specific monitoring assays such as oxidative stress measurements and cardio toxicity
 " Consulting and interpretation
 The industry, either users or producers of nano products, is in need of risk management and the substructuring analytical data to:
 - Comply with existing regulation or to anticipate on new directives,
 - Ensure a safe working environment
 - Limit liability
 - Build on public trust of nano technologies in general and specific nano products.

Intellectual Property Rights: Patent(s) applied for but not yet granted

Application Domains: Industrial manufacture; Materials technology; BIOLOGICAL SCIENCES; ENVIRONMENT; Environment protection

Comments about market applications: " High volume ability
 " Predictive testing at economic cost
 " Gain insight in nanoproducts that render them unique
 " Information and data needed to create durable and feasible commercial opportunities and applications,
 " Information as basis for investment decisions

Collaboration Details: Technical co-operation: Commercial agreement with technical assistance:

Type of partner sought: .

Network partner Stichting Syntens, Innovatienetwerk Voor Ondernemers

CZECH REPUBLIC Pegas Nonwovens s.r.o.

Sectors: Nonwovens textiles (spunbond or meltblown polyolefin fibers), hygienic applications, filtration, sorbents, wipes.

Technology keywords: Chemical Technology and Engineering; Industrial Manufacture; Materials Technology

Technology Request

TR_CZ_27446

Title: Nanofibers for spunmelt nonwoven textiles _ medical applications, filtration.

Abstract: PEGAS NONWOVENS s.r.o is one of the leading European producers of nonwoven textiles for use primarily in the personal hygiene products market. PEGAS NONWOVENS s.r.o supplies its customers with spunbond and meltblown polypropylene- and polypropylene/polyethylene based textiles principally for use in disposable hygiene products and, to a lesser extent, in construction, agricultural and medical applications.

Detailed description: PEGAS NONWOVENS s.r.o is looking for technology of nanofibers deposition on nonwoven fabric to achieve improved barrier properties.

Intellectual Property Rights: Others

Application Domains: Industrial manufacture

Comments about market applications: Hygiene, construction, agricultural and medical products.

Collaboration Details: Technical co-operation:

Type of partner sought: SME or research center (university) for technical co-operation and research&development partnership. Start of partnership immediately.

Network partner NO

Italy

Sincrotrone Elettra S.C.p.A.

Technology keywords: Chemical Technology and Engineering

Partner Search

PS_IT_27513

Title: New materials _ membranes for catalytic reactors

Abstract: Sincrotrone Trieste S.C.p.A. (ST) operates Elettra, an international multidisciplinary laboratory specialized in Synchrotron radiation and its use in Materials Science and Nanotechnology. The laboratory features a 2.4 GeV, third-generation synchrotron radiation source, named Elettra, and a fourth-generation light source based on a free-electron laser, FERMI@Elettra, currently under construction and that will be coming online in 2009. For more information, please see www.elettra.trieste.it

Detailed description: Project type: collaborative research project
 Status: building up consortium
 Research Area: Sustainable chemistry
 Work Programme: NMP-FP7
 Topic: New materials _ membranes for catalytic reactors
 Project description:
 Research on the integration of multidisciplinary competence, from preparation and characterization, combined with modelling, to materials and reactor design with the use of selective membranes and process engineering, is needed in order to enable the control of the multiple factors determining reactivity and to explore the new process possibilities. The focus should be on highly innovative long-term research which opens new breakthrough concepts for the optimisation of chemical processes highly relevant for the chemical industry, by developing new materials and/or membrane for catalytic reactors.
 At ST it is possible to characterize materials and membranes used in catalytic reactors by monitoring the local chemical and structural composition during in-situ or after ex-situ catalytic reaction. This will allow the characterization of the materials but also the exploration of new process possibility. The available techniques are:
 1) Synchrotron radiation X-ray Photoemission Spectroscopy (XPS) that thanks to the high brilliance, tunability and energy resolution of the photon source renders XPS one of the leader techniques for the study of chemical and electronic properties of nanostructured materials used in catalytic reactors. In particular the chemical composition of the nanocomposite, their interaction with the substrate where they are supported, the degree of functionalization of nano-composites, as well as the species present on the surface of a catalyst can be monitored in real time during a chemical treatment (including gas exposure), as well as depth profiling, or the study of segregation processes at different temperatures can be achieved. This allows to monitor in real time the degradation kinetics and the thermal stability of novel nanostructured materials. Moreover, with synchrotron radiation XPS it is also possible to monitor the variations of the electronic properties (insulating or metallic state) of a material before and after degradation tests.
 2) Extended X-ray Absorption Spectroscopy (EXAFS), among other structural techniques, suited to study the microscopic properties of nano-structured material before and after degradation. Thermal properties and mechanical strength could be investigated microscopically through the analysis of the EXAFS Debye-Waller factor.

Intellectual Property Others

Rights:

Application Domains: Chemical industry

Comments about market applications: Sustainable chemistry

Type of partner sought: ST would like to be part of a European Large Collaborative Consortium as a partner and is looking for a company or research institution that is working on the establishment of a consortium that will work on the programme: new materials and/or membranes for catalytic reactors.

Network partner Veneto Innovazione S.P.A

Italy

Sincrotrone Elettra S.C.p.A.

Technology keywords: Chemical Technology and Engineering

Partner Search

PS_IT_27514

Title: Substitution of materials or components utilising green nanotechnology

Abstract: Sincrotrone Trieste S.C.p.A. (ST) operates Elettra, an international multidisciplinary laboratory specialized in Synchrotron radiation and its use in Materials Science and Nanotechnology. The laboratory features a 2.4 GeV, third-generation synchrotron radiation source, named Elettra, and a fourth-generation light source based on a free-electron laser, FERMI@Elettra, currently under construction and that will be coming online in 2009. For more information, please see www.elettra.trieste.it

Detailed description: Project type: collaborative research project
Status: building up consortium
Research Area: sustainable chemistry
Work Programme: NMP-FP7
Topic: Substitution of materials or components utilising "green nanotechnology_
Project description:
The objective of the project is to contribute to the reduction on the demand of non-environmental friendly raw materials, elimination of use of hazardous substances in production processes or the reduction of non-eco waste material, utilising nanotechnology to replace existing production routes or family of products.
The chemical, structural and electronic characterization of the replaced product or the material obtained after the replace of existing production routes it is essential.
At ST it is possible to determine thermal stability, mechanical strength and degradation kinetics of investigated materials performing structural, spectroscopic and microscopic study at different beamline laboratories. In particular with the following techniques:
1) Synchrotron radiation X-ray Photoemission Spectroscopy (XPS) thanks to the high brilliance, tunability and energy resolution of the photon source renders XPS one of the leader techniques for the study of chemical and electronic properties of surfaces and nanostructures. In particular the chemical composition of the nanocomposite, their interaction with the substrate where they are supported, the degree of functionalization of nano-composites, as well as the species present on the surface of a catalyst can be monitored in real time during a chemical treatment (including gas exposure), as well as depth profiling, or the study of segregation processes at different temperatures can be achieved. This allows to monitor in real time the degradation kinetics and the thermal stability of novel nanostructured materials. Moreover, with synchrotron radiation XPS it is also possible to monitor the variations of the electronic properties (insulating or metallic state) of a material before and after degradation tests.
2) Extended X-ray Absorption Spectroscopy (EXAFS), among other structural techniques, suited to study the microscopic properties of nano-structured material before and after degradation. Thermal properties and mechanical strength could be investigated microscopically through the analysis of the EXAFS Debye-Waller factor.

Intellectual Property Rights: Others

Application Domains: Materials technology
Comments about market applications: Sustainable chemistry

Type of partner sought: ST would like to be part of a European Large Collaborative Consortium as a partner and is looking for a company or research institution that is working on the establishment of a consortium that will work on the programme: substitution of materials or components utilising "green nanotechnology".

Network partner Veneto Innovazione S.P.A

Italy

Sincrotrone Elettra S.C.p.A.

Technology keywords: Energy production, transmission and conversion

Partner Search

PS_IT_27515

Title: Thermoelectric energy converters based on nanotechnology

Abstract: Sincrotrone Trieste S.C.p.A. (ST) operates Elettra, an international multidisciplinary laboratory specialized in Synchrotron radiation and its use in Materials Science and Nanotechnology. The laboratory features a 2.4 GeV, third-generation synchrotron radiation source, named Elettra, and a fourth-generation light source based on a free-electron laser, FERMI@Elettra, currently under construction and that will be coming online in 2009. For more information, please see www.elettra.trieste.it

Detailed description: Project type: collaborative research project
Status: building up the consortium
Research Area: Nanomaterials for energy
Work Programme: NMP-FP7
Topic: Thermoelectric energy converters
Project description: Nanostructured materials show better thermoelectric properties than their bulk counterparts and could attain the kind of performance needed for widespread application of thermoelectric technology in power generation and refrigeration. Research should focus on the understanding of processes occurring at nano-metric scale in order to reduce interface resistance, improving heat transfer to/from surfaces and substantially improving the ZT value (thermoelectric figure of merit) of thermoelectric material with respect to the state-of-the-art. The final object is to obtain nanostructured thick film or 3D materials for higher scale power generation and cooling application. ST will study the electronic properties of nanostructured thermoelectric materials taking advantage of photoemission spectroscopy and microscopy techniques based on synchrotron radiation. Such techniques allow the electronic structure determination which is intimately related to the thermoelectric efficiency. Research activity at ST will be conducted by top-level researchers following a multidisciplinary approach. Partners already involved: to be found
Project budget: about 2M€

Intellectual Property Rights: Others

Application Domains: ENERGY
Comments about market applications: Nanomaterials for energy

Type of partner sought: Role:
1) University/Research institution that synthesize nanostructured thermoelectric energy converter material
2) University/Research institution that model the nanostructured material properties
3) University/Research institution that perform transport measurements on thermoelectric energy converted material
4) SME that produce thermoelectric energy converted material based on nanotechnology
5) SME that utilize thermoelectric energy converter material as thermoelectric refrigerators and/or power generators



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4th June

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Country/region: EU, India, China, South America, USA
Start of partnership: second half of 2010

Network partner

Veneto Innovazione S.P.A

Italy

Sincrotrone Elettra S.C.p.A.

Technology keywords: Energy production, transmission and conversion; Micro- and Nanotechnology related to physical and exact sciences; Nanotechnologies related to electronics and microelectronics

Partner Search

PS_IT_27516

Title: Organic-inorganic hybrids for electronics and photonics

Abstract: Sincrotrone Trieste S.C.p.A. (ST) operates Elettra, an international multidisciplinary laboratory specialized in Synchrotron radiation and its use in Materials Science and Nanotechnology. The laboratory features a 2.4 GeV, third-generation synchrotron radiation source, named Elettra, and a fourth-generation light source based on a free-electron laser, FERMI@Elettra, currently under construction and that will be coming online in 2009. For more information, please see www.elettra.trieste.it

Detailed description: Project type: collaborative research project
 Status: building up the consortium
 Research Area: Knowledge based smart materials with tailored properties
 Work Programme: NMP-FP7
 Topic: Organic-inorganic hybrids for electronics and photonics
 Project description: Integration of both organic and inorganic (semiconductors, metals and oxides) into hybrid technology may allow the advance in devices due to both the combination of building-blocks at the nanoscale and new properties that may appear at the interface. Research should focus on developing innovative organic-inorganic hybrid material at nano-scale in order to reduce the processing costs in components and achieve further functionalities in many areas, like tuneable dielectrics and photochromic materials. ST will study the electronic properties and structures of organic and inorganic nanostructured materials and of the interface between organic-inorganic hybrids taking the advantage of electron spectroscopies, like photoemission and x-ray absorption spectroscopy, and synchrotron based spectromicroscopy techniques. Moreover, the unique possibility to change the photon energy allow the use of resonant photoemission, that is a sort of _pump-and-probe_ technique with a resolution in the femto-(atto-)second regime (_core hole clock_), which allows the study of the charge transfer timescale at the hybrid interface. Research activity at ST will be conduct by top-level researchers following a multidisciplinary approach. Partners already involved: F. Biscarini (CNR, BO) Project budget: about 2M-

Intellectual Property Rights: Others

Application Domains: Materials technology
Comments about market applications: Knowledge based smart materials with tailored properties

Type of partner sought: Role:
 1) Univerity/Research partner that synthesize the organic-inorganic nanostructured hybrid material
 2) Univerity/Research partner that model the nanostructured material properties

- 3) University/Research institution that perform transport measurements
 - 4) University/research institution that perform microscopy (STM, AFM, SEM, TEM) investigation
 - 5) SME that utilize the hybrid organic-inorganic materials for the production of devices
- Country/region: EU, India, China, South America
Start of partnership: second half of 2010

Network partner

Veneto Innovazione S.P.A

Italy

Sincrotrone Elettra S.C.p.A.

Technology keywords: Energy storage and transport

■ Partner Search

PS_IT_27517

Title: Material and processes for automotive electrochemical storage applications

Abstract: Sincrotrone Trieste S.C.p.A. (ST) operates Elettra, an international multidisciplinary laboratory specialized in Synchrotron radiation and its use in Materials Science and Nanotechnology. The laboratory features a 2.4 GeV, third-generation synchrotron radiation source, named Elettra, and a fourth-generation light source based on a free-electron laser, FERMI@Elettra, currently under construction and that will be coming online in 2009. For more information, please see www.elettra.trieste.it

Detailed description: Project type: collaborative research project
Status: building up consortium
Research Area:
Work Programme: NMP-FP7
Topic: Material and processes for automotive electrochemical storage applications
Project description:
(breve introduzione al tipo di progetto)
Within the scope of _green car_ initiative, research project are called for addressing innovative materials for battery components, material architectures and systems for automotive electrochemical storage. The project should contribute to the establishment of strong strategic positions for Europe in emerging materials science for batteries and supercapacitors. Local environment and valence states of cations in Li-ion batteries can be analyzed by in situ X-ray absorption spectroscopy and X-ray photoemission spectroscopy. Information on structural and valence change during battery operation is essential to determine optimum synthesis route parameters to prepare cathode material with best overall performances.

Intellectual Property Rights: Others

Application Domains: ENERGY
Comments about market applications: Sustainable chemistry

Type of partner sought: ST would like to be part of an European Large Collaborative Consortium as a partner and is looking for a companies or research institutions that are working on the building of a cooperative consortium focused on the materials and processes for automotive electrochemical storage application.

Network partner Veneto Innovazione S.P.A

Italy

Sincrotrone Elettra S.C.p.A.

Technology keywords: Energy production, transmission and conversion; Environment; Materials Technology; Micro- and Nanotechnology related to physical and exact sciences; Nanotechnologies related to electronics and microelectronics

Partner Search

PS_IT_27519

Title: Hybrid organic/inorganic photovoltaic cells

Abstract: Sincrotrone Trieste S.C.p.A. operates Elettra, an international multidisciplinary laboratory specialized in Synchrotron radiation and its use in Materials Science and Nanotechnology. The laboratory features a 2.4 GeV, third-generation synchrotron radiation source, named Elettra, and a fourth-generation light source based on a free-electron laser, FERMI@Elettra, currently under construction and that will be coming online in 2009. For more information, please see www.elettra.trieste.it

Detailed description: Project type: collaborative research project
Status: building up consortium (one partner from Israel already available)
Research Area: Organic Optoelectronics, Colloids
Work Programme: NMP-FP7
Topic: Organic-inorganic hybrids for electronics and photonics
Project description:
Novel TiO₂/conjugated polymer photovoltaic devices will be tested as viable materials for next-generation, low-cost photovoltaic cells. The focus is on innovative methods to optimize and stabilize the TiO₂/polymer interface, so to achieve the highest possible charge transfer between the organic layer and the inorganic one, without affecting the overall charge transport performances of the whole device. In particular, polymers designed to strongly adhere to the surface of properly nanostructured TiO₂ will be synthesized and tested in real devices, looking for hierarchical self-assembling of the inorganic nanostructures in presence of the polymer chains, which will cooperate with the bottom-up organization of the final composite photoactive layer. ST could bring to this project the following contributions:
- unmatched possibilities with respect to the characterization of the inorganic nanostructures, as well as to the possibility of investigating the spatial morphology of the polymer chains in presence of nanostructures capable of self-organization.
- The development of novel polymeric structures tailored for the TiO₂ nanostructure characteristics;
- The ability of characterizing the charge transfer processes at the inorganic/organic interface that will become available to the ST laboratory from the first months of 2010, when the new FERMI free electron laser will become operative.

Intellectual Property Rights: Others

Application Domains: Materials technology; ENERGY; ENVIRONMENT
Comments about market applications: Photovoltaics, Nanotechnology, Materials Science

Collaboration Details: Technical co-operation: Financial resources:

Type of partner sought: ST would like to be part of a European Collaborative Consortium as a partner for this topic and is looking for companies/research institutions willing to



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participate to possible calls published on the theme in 2009/2010.

Network partner

Veneto Innovazione S.P.A

Italy

Sincrotrone Elettra S.C.p.A.

Technology keywords: Micro- and Nanotechnology related to Biological sciences

Partner Search

PS_IT_27520

Title: Nanotech-based sensors with modulated multi-functionality

Abstract: Sincrotrone Trieste S.C.p.A. operates Elettra, an international multidisciplinary laboratory specialized in Synchrotron radiation and its use in Materials Science and Nanotechnology. The laboratory features a 2.4 GeV, third-generation synchrotron radiation source, named Elettra, and a fourth-generation light source based on a free-electron laser, FERMI@Elettra, currently under construction and that will be coming online in 2009. For more information, please see www.elettra.trieste.it

Detailed description: Project type: Large-scale integrating collaborative project
Status: building up the consortium
Research Area: Nanomanufacturing and Industrial technologies
Work Programme: NMP-FP7
Topic: Nanotech-based multi-parameter sensors
Project description: The project is aimed to the development and production of bio-labelling and bio-imaging sensors based on rare earths and magnetic compounds nanocrystals and on improved composite materials based on polymers and inorganic nanoparticles. In particular nanocomposites with sensing function are becoming a new area of interest in the field of optical gas sensor. The size scale of polymers makes them convenient as a scaffold to orient and arrange other nanomaterials to produce anocomposites with enhanced properties and the introduction of nanoparticles to polymer matrix ensures significant property improvements at very low loading levels with respect to traditional microparticle additives. These effects are driven not only by the small size but also by the shapes and aspect ratios of the additives. Research will be focused onto modification of the nanoparticles architecture in order to obtain systems having specific surface and microstructural properties, optimize polymerization conditions in order to maximize performance and minimize costs and to study the effect of the nanocomposite composition in the microstructure's development during the processing. The role of ST in understanding of processes occurring at nano-metric scale will be study the structural properties and the formation kinetics of the nanocomponents, relating the architecture of the nanocomponents to their functional activity. Research activity at ST will take advantage of the capabilities of the newly constructed Material Characterization by X-ray diffraction (MCX) beamline dedicated to diffraction studies from polycrystalline materials, surfaces, thin films, and coatings which has entered in function in the early 2009. Partners already involved: Assembling of sensors will be in partnership with Associazione CIVEN Via delle Industrie 5 Torre Hammon 30175 Venezia-Marghera, which is part of Veneto Nanotech. For more information see www.civen.org

Intellectual Property Rights: Others

Application Domains: BIOLOGICAL SCIENCES
Comments about market applications: Nanomanufacturing and Industrial technologies

Type of partner sought: 1) University/Research institution(s) that synthesize nanostructured material

(polymers and quantum dots)

2) University/Research institution that model the nanostructured material properties

3) SME that produce sensors based on nanotechnology

Country/region: EU, India, China, South America

Start of partnership: second half of 2010

Network partner

Veneto Innovazione S.P.A

Italy

Sincrotrone Elettra S.C.p.A.

Technology keywords: Chemical Technology and Engineering; Energy production, transmission and conversion; Energy storage and transport; Environment; Industrial Manufacture; Materials Technology; Micro- and Nanotechnology related to Biological sciences; Micro- and Nanotechnolo

■ Know-how/ expertise

KHE_IT_27518

Title: Photoemission chemical imaging/spectroscopy at nanometer scale

Abstract: Elettra, the Italian synchrotron lighth facility hosts 3 photoemission microscopes able to perform chemical imaging with a spatial resolution down to 30nm and photoemission spectroscopy from regions as wide as 100nm with an overall energy resolution below 200meV. Measurements can be performed on heated/cooled samples, with applied potentials and in presence of gas environments. Special setups can be arranged to expose samples to ambient pressure and/or liquid media.

Detailed description: Photoemission is a surface sensitive technique of analysis ideal for the investigation of chemical, electronic and physical properties of matter. Synchrotron sources offer the unique possibility to combine photoemission with microscopy. Elettra hosts 3 different photoemission microscopes each designed to satisfy specific research topics. In general the spatial resolution, i.e. the smallest area from which the signal is detected, ranges from 30 to 100 nm depending from the microscope. The overall energy resolution available ranges from 100 to 200 meV depending from the microscope well below the resolution available at conventional machines. Despite the photoemission is an ultra high vacuum based technique in situ measurements can be performed with gas ambient up to 10-5 mbar and with special equipment exposures to ambient pressures or liquids in controlled atmosphere are available. Fine material characterization (for example complementary to fluorescence analysis), catalytic systems, nanosystems of every type (CNT, TCO, nanosensors, etc.) are only few examples of systems that can benefit from photoemission spectro-microscopy analysis. Areas of added values:
- Novel tools for real time and condition investigation of nanosystems. Despite large spot photoemission spectroscopy is nowadays available still an ambient pressure photoemission microscope does not exist. Technology is now ready to design this machine.
- Mastering nano-scale complexity in materials. The capability of photoemission to perform a fine chemical analysis is well known. The possibility to perform it at the nanometric scale is still available at very few places.

Intellectual Property Rights: Others

Application Domains: Industrial manufacture; Materials technology; Chemical industry; ENERGY; BIOLOGICAL SCIENCES; ENVIRONMENT; Environment protection

Comments about market applications: " XPS spatially resolved analysis of heterogeneous surfaces and interfaces, thin films, micro- and nano-sized materials.
" Local changes in the chemical composition and electronic structure of surfaces and interfaces as result of corrosion, irradiation, applied potential etc.
" Mass transport phenomena and other dynamic processes at surfaces.
" In situ measurements at high T (<1120 K), low T (>150 K), under biasing, in

gas atmosphere ($p < 3 \times 10^{-6}$ mbar), ex situ treatments at higher pressure (till atmospheric) in UHV connected chambers.

" Spatial resolution available (SPEM): imaging: 75nm, spectroscopy: 150nm; overall energy resolution @ RT: 200meV

Collaboration Details: Financial resources:

Type of partner sought: Elettra offers his expertise and know-how in the material science investigated by means of photoemission spectro-microscopy. Universities, Research Centers, Large and SME Companies operating in the fields of Nanotechnologies related to electronics and microelectronics, Materials, Catalysis and Chemical Technology can benefit from this investigation technique. Moreover the availability in the same institute of many other techniques of analysis makes Elettra an ideal partner in many projects. Our experience in the coordination and participation of national and trasnational projects is proved by the long list of past and present collaborations.

Network partner Veneto Innovazione S.P.A

CZECH REPUBLIC SKODA VYZKUM

Sectors: Power Engineering, Rail and Road Vehicles, Metallurgy

Activities: Research and Accredited Testing

Technology keywords: Chemical Technology and Engineering; Energy storage and transport; Industrial Manufacture; Materials Technology

Technology Offer

TO_CZ_27174

Title: Thermal Sprayed Coatings

Abstract: Research and testing focused on improving in service life of power engineering devices-vibration diagnostics, material tests, service life assessment. Reliability and service life of rail and road vehicles-computer simulation, fatigue tests, stress measurement. Accredited tests for big companies and SME. Computing in the field of strength, fatigue, crash and aerodynamics.

Detailed description: Application of protective coatings using thermal spraying methods (HP/HVOF TAFA JP-5000). Thermal sprayed coatings resistant to wear, abrasion, erosion, corrosion, high temperatures, etc. based on metals, alloys, superalloys, cermets and ceramics in the field of production and renovation. Thermal spraying of parts up to the length of 4000 mm, diameter of 1100 mm and weight of 3200 kg. Spraying of abradable coatings for turbine seals, which increase the efficiency of turbines.

Intellectual Property Rights: Others

Application Domains: Industrial manufacture; Materials technology; Chemical industry; ENERGY; Environment protection

Comments about market applications: Thermal sprayed coatings can be used in many industrial fields especially in power engineering, in power stations and heat stations, chemical industry, engineering etc.

Type of partner sought: Industrial companies from above mentioned branches - big companies and SME

Network partner BIC Plzen - Business and Innovation Centre

Italy

Skysset SpA

Sectors: Multimedia products and Information Technology Solutions

Activities: Video Knowledge Management

Technology keywords: Chemical Technology and Engineering; Energy production, transmission and conversion; Energy storage and transport; Environment; Industrial Manufacture; Materials Technology; Micro- and Nanotechnology related to physical and exact sciences; Nanotechnologie

Technology Offer

TO_IT_27357

Title: Knowledge to Know®

Abstract: Video Knowledge Management; Software Platform - recognize atypical situations through the intelligent analysis of the scene, decodes the meaning of the records captured from a video flow.

Detailed description: Description: System of acquisition, processing, recognition, recording and remote transmission of atypical situations. The Intelligent Analysis of the Scene is able to underline the conceptually meaningful contents, automatically extracting the meaning of both non-structured and semi-structured contents
Status: patented
Project budget: 2.000.000 Euro

Intellectual Property Rights: Exclusive rights

Application Domains: Industrial manufacture; Materials technology; Chemical industry; ENERGY; ENVIRONMENT; Environment protection

Comments about market applications: Road Control; Environment Monitoring; Behavioural Analysis; Artistic and architectonic assets monitoring; Multitracking.

Collaboration Details: Licence agreement: Technical co-operation: Joint Venture agreement: Commercial agreement with technical assistance: Financial resources:

Type of partner sought: Hardware solutions; technology integration, new materials, market share and distribution, from any state, country or region.

Network partner Veneto Innovazione S.P.A

Spain

SPANISH NATIONAL RESEARCH COUNCIL

Technology keywords: Energy production, transmission and conversion; Materials Technology; Nanotechnologies related to electronics and microelectronics; Renewable Sources of Energy

Technology Offer

TO_ES_27258

Title: PHOTONIC CRYSTAL FOR THE ENHANCEMENT OF THE EFFICIENCY MORE THAN 20% IN SOLAR CELLS, PHOTODETECTORS AND THERMO-PHOTOVOLTAIC DEVICES

Abstract: The Spanish National Research Centre (CSIC) is the largest public research institution in Spain. The CSIC is a multidisciplinary organisation with 130 centres located nationwide and a workforce of 13000. The CSIC files an average of 60 international PCT applications and 150 Spanish patent applications and signs more than 60 technology licenses each year.

Detailed description: The photonic crystals are prepared by modification of the superficial topography of semiconductor III-V materials, by means of the fabrication of a tidy network of cavities filled with another material with different refraction index. This network of cavities, creates photonics bands on the material surface, that changes the value of the refraction index of the material used. The variation of the refraction index value lets, depending of the angle of incidence and the wavelength of the light, favour or inhibit the transmission and the reflection of the light.
The photonic crystals enhance the reflexion, transmission and refraction of the light for different wavelengths and incidence angle, inside the material of the device they are supported.
This property is absolutely novel, being the first time that it is observed and measured and open new perspectives for the use of this kind of modified materials and differs from antireflection layers or random special topography (like the use of pyramids on the surface of silicon solar cells). The main advantage of these photonic crystals is that they enhance the transmission of light for wide angles of incidence, while antireflection layers and corrugated surfaces (like pyramids) are limited by the incident angle.

Intellectual Property Rights: Patent(s) applied for but not yet granted

Application Domains: ENERGY
Comments about market applications: Photovoltaic and Energy Industry

Collaboration Details: Licence agreement: Technical co-operation:

Type of partner sought: The research centre in looking for a partner for a further development of the technology and also the manufacture and and commercialitation of it

Network partner Consejo Superior De Investigaciones Cientificas

Spain

SPANISH NATIONAL RESEARCH COUNCIL

Technology keywords: Chemical Technology and Engineering; Environment; Industrial Manufacture; Materials Technology; Waste Management

Technology Offer

TO_ES_27372

Title: HIERARCHICAL STRUCTURES AND COATINGS FROM DRY NANOPARTICLES DISPERSION

Abstract: The Spanish National Research Centre (CSIC) is the largest public research institution in Spain. The CSIC is a multidisciplinary organisation with 130 centres located nationwide and a workforce of 13000. The CSIC files an average of 60 international PCT applications and 150 Spanish patent applications and signs more than 60 technology licenses each year.

Detailed description: The process involves the use of electrostatic and van der Waals forces to effectively disperse nanoparticles. The dry process takes advantage of the natural trend of Nanoparticles (NPs) to agglomerate in order to anchor NPs on support particles or substrates. Thus the dispersion of a certain amount of NPs is produced in a variety of material from inorganic salts, synthetic or mineral ceramic powders, organic powders, semiconductor powders. The dispersion on substrates is also possible and <50 nm coating of dispersed NPs was demonstrated. The low energy dry process allows preserving the morphology and nature of the particles that serve as support even in polymer type materials. A wider variety of NPs are validating to be used and dispersed by this patented technology. Effective dispersion is afforded for spherical, fibrous or laminar NPs with the requirement that almost one of the NPs dimensions must be <100 nm. The anchoring of dispersed NPs permits their use in composites and nanocomposites in which the matrix material is used to support the particles.

Intellectual Property Rights: Patent(s) applied for but not yet granted

Application Domains: Industrial manufacture; Materials technology; Chemical industry
Comments about market applications: Powder technology, ceramic, polymers, paints, pharmacy, cosmetic, semiconductor industries&

Collaboration Details: Licence agreement: Technical co-operation:

Type of partner sought: The research centre is looking for a partner for a further development of the technology and its transfer to the productive process

Network partner Consejo Superior De Investigaciones Científicas

Spain

SPANISH NATIONAL RESEARCH COUNCIL

Technology keywords: Chemical Technology and Engineering; Industrial Manufacture; Materials Technology

Technology Offer

TO_ES_27409

Title: PREPARATION OF CONTINUOUS IN SITU FUNCTIONALLY GRADED MATERIALS BY USING SPARK PLASMA SINTERING TECHNIQUE

Abstract: Short description of activities, products and services:
The Spanish National Research Centre (CSIC) is the largest public research institution in Spain. The CSIC is a multidisciplinary organisation with 130 centres located nationwide and a workforce of 13000. The CSIC files an average of 60 international PCT applications and 150 Spanish patent applications and signs more than 60 technology licenses each year.

Detailed description: A silicon nitride material with a continuous gradient in their microstructural characteristics and properties, from on side of the ceramic component to the opposite one. A method for the in situ manufacturing of those functionally graded ceramic materials is described, which is based on the employ of a sole homogenous starting ceramic powders containing the starting silicon nitride powders plus the sintering additives, and developing a temperature profile within the powder compact during the sintering process using the spark plasma sintering technique (SPS). Those temperature variations are attained by changing the contact sections between punches and die placed into the SPS furnace, leading to different effective current intensities and, therefore, to different temperatures. The main advantage of this method is the in situ manufacturing process of the functionally graded material, which greatly simplify the transfer of the process to a mass production. In addition, the development of a continuous gradient would reduce the nucleation of stresses within the component, compared to layered processed materials, increasing its reliability under operating conditions. These functionally graded silicon nitride materials could be used in technological applications where good thermo-mechanical and tribological properties are simultaneously required, for instance, cutting tools, valves or bearings. They can also be used as substrates with a porosity gradient where carbon nanotubes were grown. This device can be used as catalysers or membranes.

Intellectual Property Rights: Patent(s) applied for but not yet granted

Application Domains: Industrial manufacture; Materials technology; Chemical industry
Comments about market applications: Aeronautical Industry, Energy industry (turbines), cutting tool or machining industries

Collaboration Details: Licence agreement: Technical co-operation:

Type of partner sought: The research centre is looking for a partner for a further development of the technology

Network partner Consejo Superior De Investigaciones Cientificas

Spain

SPANISH NATIONAL RESEARCH COUNCIL

Technology keywords: Energy storage and transport; Industrial Manufacture; Materials Technology; Nanotechnologies related to electronics and microelectronics

Technology Offer

TO_ES_27422

Title: TUNABLE RANDOM LASER

Abstract: The Spanish National Research Centre (CSIC) is the largest public research institution in Spain. The CSIC is a multidisciplinary organisation with 130 centres located nationwide and a workforce of 13000. The CSIC files an average of 60 international PCT applications and 150 Spanish patent applications and signs more than 60 technology licenses each year.

Detailed description: To obtain a random system where lasing modes can be selected at specific wavelengths, it is used a medium with resonances in the transport parameters. The idea is to exploit the resonances in scattering coefficients, called Mie resonances, which are present when the sizes are comparable with the wavelength of the incident light. The resonant condition can be easily achieved for regularly shaped resonators such as disks, cylinders or spheres.

In a random assembly of such identical scatterers, the resonances survive as peaks in the transport parameters, and in particular in $I_t(?)$. Monodisperse polystyrene spheres are chosen as constituents of a three-dimensional, solid random system called *_photonic glass_*. The resonant nature of $I_t(?)$ selects the lasing energy. Demonstrating experimentally that the lasing wavelength becomes very sensitive to the diameter of the constituent spheres and follows the resonances of the system.

In a system with a broad gain curve is observed mode competition this way, accessing more than one resonance with comparable gain.

The novelty of the present technology is the resonant selection of the emission wavelength. In standard random lasing, there is no control of the lasing emission which occurs at maximum gain of the emitting material. The random lasing described is a self-tuned, micron sized laser, that requires no alignment and that emits in all directions, leading to efficient monochromatic light source and multidirectional with very reduce dimensions (<0.001 mm³). Furthermore, a product based on this technology would be very competitive due to low production costs.

Intellectual Property Rights: Patent(s) applied for but not yet granted

Application Domains: Industrial manufacture; Materials technology; ENERGY
Comments about market applications: Photonic Industry and Communications Industry

Collaboration Details: Licence agreement: Technical co-operation:

Type of partner sought: The research centre is looking for a partner for a further development of the technology, manufacture and commercialisation

Network partner Consejo Superior De Investigaciones Cientificas

Spain

SPANISH NATIONAL RESEARCH COUNCIL

Technology keywords: Energy production, transmission and conversion; Materials Technology; Micro- and Nanotechnology related to physical and exact sciences; Nanotechnologies related to electronics and microelectronics

Technology Offer

TO_ES_27448

Title: SILICON MICROSPHERES A NEW WAY TO TRAP LIGHT

Abstract: The Spanish National Research Centre (CSIC) is the largest public research institution in Spain. The CSIC is a multidisciplinary organisation with 130 centres located nationwide and a workforce of 13000. The CSIC files an average of 60 international PCT applications and 150 Spanish patent applications and signs more than 60 technology licenses each year.

Detailed description: Silicon microspheres are new materials that can trap light more efficiently than microspheres of other materials like silica or polystyrene because they have much higher refractive index:(nSILICON ~ 3.5, nSILICA OR POLYSTYRENE ~ 1.5). They can be used one by one as photonic resonators, or all together forming disordered networks of microspheres of different sizes as optical coatings, similar to black silicon. Also, silicon microspheres allow developing an electronic circuit on an optical microcavity. Great opportunities to develop new products in different technological fields arise from silicon microspheres. For instance, they could lead to more efficient ways of converting light to electricity, or they could be used to develop efficient infrared paints.

Silicon microspheres are obtained by chemical vapour deposition techniques. The type of silicon can be amorphous, polycrystalline or porous, and the size of the spheres is from 0.5 to 5 micrometers. Because of their highly spherical shape and smooth surface, the microspheres behave as optical resonators with well defined Whispering Gallery Modes, where light is confined in a _circular trip_ inside them. This way, light can be trapped in a very small volume of less than 1 cubic micrometer. A particular realization of an optical coating based on silicon microspheres consists of a disordered network of microspheres of different sizes. This coating stops the light from the ultraviolet to the infrared, up to 15 micrometers in wavelength.

Intellectual Property Rights: Patent(s) applied for but not yet granted

Application Domains: Materials technology; ENERGY
Comments about market applications: Photovoltaics, microelectronics, infrared paints

Collaboration Details: Licence agreement:

Type of partner sought: Company to help us developing and introducing in the marked new products based on silicon microspheres

Network partner Consejo Superior De Investigaciones Cientificas

Spain

SPANISH NATIONAL RESEARCH COUNCIL

Technology keywords: Chemical Technology and Engineering; Industrial Manufacture; Materials Technology; Nanotechnologies related to electronics and microelectronics

Technology Offer

TO_ES_27452

Title: NEW PROCEDURE TO OBTAIN FULLERENES AND RELATED MOLECULES BY A CONTROLLED DEHYDROGENATION PROCESS

Abstract: The Spanish National Research Centre (CSIC) is the largest public research institution in Spain. The CSIC is a multidisciplinary organisation with 130 centres located nationwide and a workforce of 13000. The CSIC files an average of 60 international PCT applications and 150 Spanish patent applications and signs more than 60 technology licenses each year.

Detailed description: Here is presented the formation of C60 and the triazafullerene C57N3 from aromatic precursors using a new procedure and highly efficient surface-catalysed cyclodehydrogenation process. We find that after deposition onto a platinum (111) surface and heating to 750 K, the molecular precursors dehydrogenates and closes into itself to form a closed molecule of fullerene and triazafullerene molecules with about 100 per cent yield. We expect that this approach will allow the production of a range of other fullerenes and heterofullerenes of different sizes nanotubes, graphene and other molecules, once suitable precursors are available. Also, if the process is carried out in an atmosphere containing guest species, it might even allow the encapsulation of atoms or small molecules to form endohedral fullerenes

The fullerenes production can be made on nanoparticles or sheets of catalytic material, and the fullerenes stucked on can be released for further uses. This sheets can also be used as electronic molecular devices, for example electron donors, molecular transistors, photovoltaic cells.

The main features and advantages of this process are
Control of the process, this procedure is the most controlled way to synthesize fullerenes until now
Possibility of growing fullerenes of different sizes
Formation of new heterofullerenes, not synthesised up to now by other methods

Intellectual Property Rights: Patent(s) applied for but not yet granted

Application Domains: Industrial manufacture; Materials technology; Chemical industry
Comments about market applications: Microelectronic, Medicine, Pharmaceutical industry

Collaboration Details: Licence agreement: Technical co-operation:

Type of partner sought: The research centre is looking for a partner for a further development of the technology, manufacture and commercialization

Network partner Consejo Superior De Investigaciones Cientificas

Spain

SPANISH NATIONAL RESEARCH COUNCIL

Technology keywords: Environment; Materials Technology; Nanotechnologies related to electronics and microelectronics

Technology Offer

TO_ES_27463

Title: Flexible and highly efficient UV-Visible optical filters

Abstract: The Spanish National Research Centre (CSIC) is the largest public research institution in Spain. The CSIC is a multidisciplinary organisation with 130 centres located nationwide and a workforce of 13000. The CSIC files an average of 60 international PCT applications and 150 Spanish patent applications and signs more than 60 technology licenses each year.

Detailed description: Dielectric mirrors present a reflectance maximum at certain spectral positions of the electromagnetic spectrum. This property is useful to protect objects against a selected wavelength or to confer colour to an object. Moreover, the structural origin of the colour prevents the heating of the system, since no absorption is involved.

The filters offered are periodic multilayers based on inorganic particles embedded in a flexible polymer film. The polymer provides the structure with enough mechanical stability as to be lifted off and transferred to another surface of arbitrary shape. At the same time, the high dielectric contrast existing between the inorganic layers embedded within the polymer causes the resulting flexible film to present wide Bragg reflectance peaks (PS/?Ü40%) of high intensity (above 80%). Both its spectral position and width can be precisely tuned by changing the lattice parameter of the original mold to cover from UVA to near infrared radiation.

Applications are foreseen as highly efficient, transparent, adaptative, UV radiation protective coatings for surfaces of arbitrary shape. Alternatively, they can be used as highly efficient colored dielectric mirrors in different types of optoelectronic devices. This new kind of flexible and hybrid (nanoparticle-polymer) structures allows to cover different surfaces of arbitrary shape with the purpose to protect them against radiation of selected and tunable spectral range.

Intellectual Property Rights: Patent(s) applied for but not yet granted

Application Domains: Materials technology; Chemical industry; ENVIRONMENT
Comments about market applications: Optical and Optoelectronic industry

Collaboration Details: Licence agreement: Technical co-operation:

Type of partner sought: The research centre is looking for a partner for a further development of the technology, manufacture and commercialization

Network partner Consejo Superior De Investigaciones Científicas

Spain

SPANISH NATIONAL RESEARCH COUNCIL

Technology keywords: Industrial Manufacture; Micro- and Nanotechnology related to physical and exact sciences

Technology Offer

TO_ES_27466

Title: Intelligent monitoring of micro- and nano-scale manufacturing processes for optical fabrication in order to produce surface finish accuracies

Abstract: The Spanish National Research Centre (CSIC) is the largest public research institution in Spain. The CSIC is a multidisciplinary organisation with 130 centres located nationwide and a workforce of 13000. The CSIC files an average of 60 international PCT applications and 150 Spanish patent applications and signs more than 60 technology licenses each year.

Detailed description: The main goal of this technology is to improve efficiency of manufacturing aeronautical parts with surface roughness better than 10 nm by reducing the fixturing & mounting time (10%) and surface testing time (15%). The technical goals associated are the design and implementation of a networked intelligent monitoring system able to provide intelligent recommendations about the micro and nano-scale manufacturing processes. The results available are real-time systems, for predicting spindle balance in ultra-precision machining processes and for estimating surface roughness in ultra-precision machining processes.

The advantage of real-time and continuous monitoring of spindle balance is the process improvement by on-line detection of vibrations that yield waviness. The operator receives a report in real time about the status of the spindle balance and surface roughness. This intelligent recommendation allow to perform corrective actions (e.g., to diminish feed or to stop the production). Moreover, networked monitoring via Ethernet also allows that the design & production departments be updated about how is going on the micro-scale and nano-scale manufacturing processes.

The main technologies involve are communication technologies (ethernet-based approach), software engineering (embedded application), signal processing (FFT, wavelets), Artificial Intelligence-based techniques (fuzzy logic) and sensor fusion (acceleration, force and AE sensors). The intelligent monitoring system has been applied to single point diamond turning processes improving the efficiency of estimating on-line the surface roughness and reducing the surface testing time about 15%.

Intellectual Property Rights: Patent(s) applied for but not yet granted

Application Domains: Industrial manufacture; Materials technology
Comments about market applications: Industrial Manufacture

Collaboration Details: Licence agreement: Technical co-operation:

Type of partner sought: -Integrator of the offered technology (engineering SME).
-Machine tool manufacturers for micro and nano mechanical machining processes.
-Manufacturers of equipments for metrology.
-Manufacturers that produce parts with surface finish accuracies of better than 10 nm RMS on planar and non-planar surfaces.

Network partner Consejo Superior De Investigaciones Cientificas

Sweden

STFI Packforsk

Technology keywords: Chemical Technology and Engineering; Materials Technology; Micro- and Nanotechnology related to Biological sciences

Technology Offer

TO_SE_27578

Title: Innovative optoactive materials on paper, packages or textiles

Abstract: STFI Packforsk is one of the leading R&D companies within the field of pulp, paper, graphic media, packaging and biorefining.

Detailed description: The Swedish research institute STFI Packforsk has developed a line of optoactive materials. These materials can be tailored to change color when exposed to different specific stimuli, such as moisture, electricity, pH, stress, chemicals etc. Low-cost, renewable and recyclable materials can be used, in a simple fabrication technique. The institute is primarily looking for end users of the technology. Also, people with experience in interactive polymers are interesting collaboration partners.

Using small amounts of low-cost, renewable, and recyclable raw materials, the research institute has created optoactive structures. Presently, focus is set on moisture sensitivity, but other stimuli are possible as well. The simple "layer-by-layer" assembling technique enables nano-structure building of the material. This has been utilized in developing new prototypes. When exposed to humidity, or other stimuli, the material expands or contracts, causing interference colorization of the structure. When the moist evaporates, the material returns to its original state, and the color disappears.

Intellectual Property Rights: Secret know-how

Application Domains: Materials technology; Chemical industry; BIOLOGICAL SCIENCES
Comments about market applications: Product safety: Appearance and stimuli responsivity to ensure authenticity of packages ("tampering indicator").
 Anti-counterfeiting: Bank note security features, difficult to copy.
 Marketing: Display functions for ICT, paper, packages, textiles etc; messages and/or images appear, e g when an object is breathed upon or grabbed by the hand.
 Branding: Adding positive value to trademarks.
 Cosmetics; e g hair coloring with interactive dyes.

Collaboration Details: Technical co-operation: Financial resources:

Type of partner sought: Company or institute with interest in developing new application areas for these materials
 Producer/vendor of interactive polymers

Network partner Acreo Ab

CZECH REPUBLIC SYNPO a.s.

Sectors: R&D applied polymer science, manufacture of coatings

Activities: We have developed new ways to modify nanoparticles of montmorillonite to

Technology keywords: Chemical Technology and Engineering; Energy storage and transport; Industrial Manufacture; Materials Technology

■ Know-how/ expertise

KHE_CZ_27464

Title: Technology for producing unique nanoparticles with attractive performance characteristics

Abstract: Synpo has existed as an R&D center for more than 60 years. It was a government-owned R&D center for research into coatings and resins until 1992, when it became a privately held corporation, which continued to carry out commercial R&D for clients. Synpo has many years of experience in applied polymer science and in the development of products for coatings, composites, adhesives, and various binders used in electronic industries and in graphic arts. Synpo carries out R&D for some of the biggest chemical companies in the world. Synpo has been consistently profitable company with stable workforce,

Detailed description: Synpo developed a new technology for modifying and stabilizing nanoparticles of montmorillonite and other materials for application in coatings, adhesives, composites and binders. These new types of nanoparticles impart significantly improved physical properties to various products based on binders, such as acrylics, urethanes, unsaturated polyesters, epoxies, various types of elastomers, and hybrids of these various binders. Physical properties thus achieved are superior to those which can be obtained with commercially available nanoparticles. Synpo has a technology to make unique modifying agents, which then result in tailor-made particles for specific binders. Several papers on the subject have been published. This technology has been validated in laboratory environment but has not yet been scaled up.

Intellectual Property Rights: Exclusive rights

Application Domains: Materials technology; Chemical industry

Comments about market applications: Synpo is looking for a partner who is interesting evaluating these materials in some specific commercial applications with a significant volume potential. Furthermore, we are looking for a partner who would be interested in a collaboration leading to building a pilot plant for this process with potential extension of this collaboration to a full scale manufacturing facility. Synpo does not have facilities or resources to make these materials on a

Collaboration Details: Licence agreement: Technical co-operation: Joint Venture agreement:

Network partner BIC Plzen – Business and Innovation Centre

CZECH REPUBLIC Technical university of Liberec

Sectors: nanotechnology in remediation; risk of nanomaterials

Activities: research of nanomaterials in environmental protection

Technology keywords: Chemical Technology and Engineering; Environment; Micro- and Nanotechnology related to Biological sciences; Waste Management

■ Partner Search

PS_CZ_27312

Title: Application of zero-valent nanoiron in environmental technologies

Abstract: research of nanoparticles based on iron; application in remedial action for contaminated groundwater, surface water wastewater; application of nanofibres in biotechnologies; risk of nanomaterials for environment; education in nanotechnologies and esp. nanomaterial sciences; radioactive waste repository; mathematical modeling

Detailed description: laboratory and field test of zero-valent nanoparticles; surface modification of nanoparticles; experiences with pilot tests and full scale remediation design with nanoparticles; combination of bioremediation methods and nanotechnologies; work on number of national and international projects in this field; cooperation in education in the field of nanomaterials

Intellectual Property Rights: Others

Application Domains: ENVIRONMENT; Environment protection

Network partner NO

Poland

The Silesian University of Technology

Sectors: Research, Education

Technology keywords: Energy storage and transport; Materials Technology; Nanotechnologies related to electronics and microelectronics; Renewable Sources of Energy

Partner Search

PS_PL_27508

Title: Photovoltaic properties of polycrystalline silicon

Abstract: Research conducted in the Faculty is focused on: nanotechnology, renewable resources-solar cells, materials and technologies used in dentistry, steel materials for structural alloys, amorphous and crystalline materials; steel and sintered materials used for tools; energy-efficient technologies of processing tool materials; biomedical engineering; engineering of surface layers obtained in heat, thermo-chemical and physical processes; corrosion resistance of steels and alloys; quality control.

Detailed description: One of the most important alternative for conventional sources of energy is solar energy. It is referred to as solar radiation that reaches the earth. Solar energy can be converted directly or indirectly into other forms of energy such as heat and electricity. A direct conversion of solar energy into electricity is performed by photovoltaic devices referred to as solar cells. The main drawback in the use of photovoltaic technology is the intermittent and variable character of solar light. However, this technology has many significant advantages compared with conventional sources of energy. It is pollution free and clean, has no moving parts, produces no noise and requires very little maintenance. It does not require connection to a power grid since it can operate as a standing alone system. It is very promising alternative as far as environment protection is concern since the use of this technology may significantly reduce chemical, radioactive and thermal pollution. Therefore, it may be helpful in reducing the greenhouse effect. In addition, it may be treated as a renewable and virtually inexhaustible source of energy in the context of expected duration of sun activity. As a consequence, it is very attractive new technology for power generation. So far, it is not competitive with conventional sources of energy because of high production costs of solar cells but experts predict that with mass production and improvement in technology the unit price will drop and the significance of this technology in the energy production will systematically increase in future. In order to decrease production costs of photovoltaic systems intensive research in the area of multicrystalline silicon solar cells is carried out. It is one of the most environmental friendly material of high abundance in the crust of Earth. It is competitive material for photovoltaics compared with monocrystalline silicon due to relatively low production cost and acceptable efficiency of cells.

Intellectual Property Rights: Others

Application Domains: Materials technology; ENERGY

Collaboration Details: Technical co-operation:

Type of partner sought: We looking for a partner to realized our project which consist in uecne of laser texturing on photovoltaic properties of polycrystalline silicon.

Network partner SINTEF