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## ADVANCED RESEARCH INSTITUTE FOR ELECTRICAL ENGINEERING (SC ICPE-CA)

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### ● Department for Micro And Nano-Structured Materials and Their Applications

Contact person: **Dr. Phys. Jenica Neamtu ([jenica\\_neamtu@icpe-ca.ro](mailto:jenica_neamtu@icpe-ca.ro))**

Micro and nano-structured materials which have new completely and different properties both pure materials and chemical elements alloys made of and on natural and synthetic way, with special magnetic and electric properties. Main applications of micro and nano-materials made on synthetic way are: screens and filters from composite magnetic materials for non-ionized electromagnetic radiation in the range of frequency 50 Hz, 1 MHz and microwaves 0,8-40 GHz; magnetic multilayers nanometric structures [magnetic metal / non-magnetic metal], which have different transport properties vs. bulk materials and giant magneto-resistivity (MRG). In our research we approached the nanometric structures of Permalloy/Cu/Permalloy and Permalloy/Mo/ Permalloy type, with application in magnetic microsensors; micro-granulated magnetic materials for nondestructive control of subassemblies and pieces; polymeric composite materials with determined electrical and magnetic properties of polynuclear complex combination; metal-polymeric micronic film for protection coatings; oxidic materials with perovskite structure for using in gas sensors, obtaining by non-conventional technologies; magnetic thin mono-layers structures for magneto-resistivity sensors.

### ● Magnetic Materials and Electrical Engineering Applications Department

Contact person: **Eng. Ion Ivan ([magnet@icpe-ca.ro](mailto:magnet@icpe-ca.ro))**

Researches on nanostructured composite magnetic materials of (Nd,Pr)FeB/aFe for obtaining of permanent magnets were developed. For these materials, the magnetic hardening phenomena is depending on exchange interactions between hard magnetic phase (Nd<sub>2</sub>Fe<sub>14</sub>B) and soft magnetic phase (aFe).

### ● Ceramic Department

Contact person: **Dr. Phys. Gheorghe Gavrilu ([gavriliu@icpe-ca.ro](mailto:gavriliu@icpe-ca.ro))**

Researches on nano-materials and nano-ceramics based on alumina and composite.

### ● Carbon Materials Laboratory

Contact person: **Phys. Ana Maria Bondar ([abondar@icpe-ca.ro](mailto:abondar@icpe-ca.ro))**

Designing and developing carbon multifunctional nano-composites based on mesophase pitch (MP) and nano-carbons (NC) additives, particularly for EMI shielding, but also able to satisfy the needs for additional functionality such as: electrical, chemical, biological etc. The nano-carbon additive amount has an important influence on the morphology, being in closely correlation with both structural and functional properties of the designed carbonic composite materials. Controlling the ratio of the additives and heat treatment domain, can be designed a carbonic nano-composite material for absorption of electromagnetic waves, in a certain range of frequencies.

## NATIONAL RESEARCH-DEVELOPMENT INSTITUTE FOR CRYOGENICS AND ISOTOPIC TECHNOLOGIES ICSI RM. VALCEA

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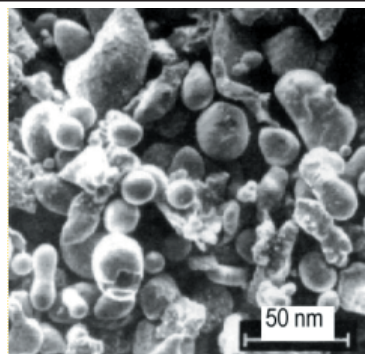
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The main activity of institute is structured on the headlines:

- studies of the separation process of hydrogen isotopes;
- studies concerning cryogenic processes and specific equipments;
- separation and purification of gases;
- advanced materials;
- current production and technologies transfer.



*Production of the fullerene soot with C60-C70 mixture; the extraction of C60-C70 mixture, their separation and analysis by FT-IR spectroscopy (details in MNT-Bulletin V2, no.2-3)*



*SEM micrography of YSZ powders (details in MNT-Bulletin V3, no.1)*

## INSTITUTE FOR NON-FERROUS AND RARE METALS, RESEARCH GROUP FOR NANCERAMIC MATERIALS

**Scientific Director : Dr. C. Gurgu ([cgurgu@imnr.ro](mailto:cgurgu@imnr.ro))**

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The main topics related to research of nanostructured materials are: Wet chemical synthesis of nanocrystalline ceramic powders, Development of chemical processes for thin/thick nanocrystalline ceramic films, Processing of ceramic and composite powders, Fundamental studies regarding mechanisms/kinetics of the processes and interfacial reactions in nanostructured materials. Some important achievements: Hydrothermal synthesis processes for high purity, YSZ and YTZP zirconia nanopowders, Sol-gel colloidal and hydrothermal synthesis processes of doped BaTiO<sub>3</sub> powders, Sol-gel colloidal synthesis processes of Pb(La, Sn)Zr ceramic powders, Sol-gel colloidal synthesis of Al<sub>2</sub>O<sub>3</sub>-ZrO<sub>2</sub>, Core/shell structured metal / ceramic powders for coatings and sintered compacts, Hydrothermal synthesis of pure and zirconia doped hydroxy-apatite(HAP) powders, Electrochemical deposition of thin PZT films.

## UNIVERSITATEA OVIDIUS CONSTANTA, FACULTY OF PHYSICS, CHEMISTRY AND PETROLEUM TECHNOLOGY, INTERDISCIPLINARY RESEARCH CENTER ON MICRO- AND NANOSTRUCTURES

**Director: Associated Professor Dr. Victor Ciupina ([vciupina@univ-ovidius.ro](mailto:vciupina@univ-ovidius.ro))**

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The main topics of research are interdisciplinary, focusing on condensed matter either nanostructured (thin films, multilayer structures, materials obtained by crystal structure engineering) or microstructured (biological systems and electro-thermo-energetical systems). The main experimental techniques used consist of electron microscopy, optical microscopy, galvanomagnetic examination, vacuum deposition, plasma deposition, electrochemical etching, acoustic microscopy, etc.