

PARTNER PRESENTATION AND INTEREST IN HORIZON EUROPE PARTICIPATION

## Title: Nanoparticles and thin films of ZnO and ZnO doped with metal ions

### Short description of topic (scientific description)

Our research group has conducted research to obtain room temperature ferromagnetism of dilute magnetic semiconductors (DMS). Thus we have synthesized ZnO doped transition metals (Fe, Ni, Co, Mn) by the sol-gel method in the form of thin films and nano powders.

These were characterized from the structural point of view (XRD), the surface morphology (AFM) and magnetic properties (VSM).

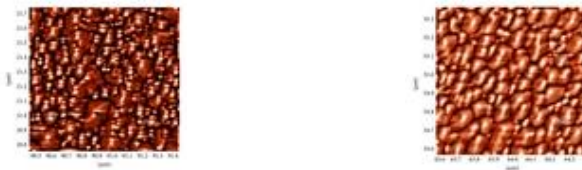


Fig.1. AFM micrographs of thin film surface for (a)  $Zn_{0.97}Ni_{0.03}O$  and (b)  $Zn_{0.97}Fe_{0.03}O$ .

Another direction of research addressed the study of the antibacterial and antifungal properties of ZnO nanoparticles and ZnO doped with metal ions. Nano powders of undoped nanostructured ZnO and ZnO doped with metal ions (Mn, Ag) were synthesized by sol-gel method and characterized regarding the structural (XRD, FT-IR), morphological and dimensional (SEM), optic (UV-Vis) and the specific surface (BET method) properties.

### Short description of Organization/Laboratory/Department:

The Magnetic Materials Laboratory has extensive experience in the research of hard and soft magnetic alloys obtained in cast, melt-spun ribbons, microwires and thin film forms experimentally developed for various applications. Besides research the department has experience also in  $Nd_2Fe_{14}B$  and Alnico magnets production.

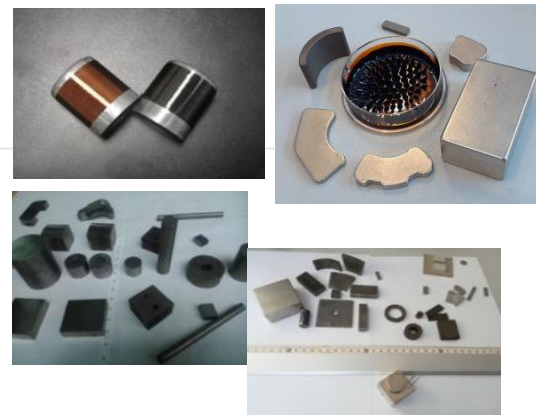
Main areas:

#### I) Hard magnetic materials

- Researches for Reducing Deficient Elements (Rare Earths, Co, etc.)
- Improving the magnetic properties of classical magnets by structural changes
- New magnets with spin interaction
- Emerging technologies for recovery of magnet from waste
- WEEE applications of hard magnetic materials

#### II) Soft magnetic materials

- RDI for new magnetic micro / nanostructure materials or amorphous alloys
- RDI for new soft magnetic micro / nano powders materials usable in additive manufacturing
- Soft magnetic materials applications



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Reference of Call/ topic of interest.

Potential contribution/ main ideas

Advanced materials / Manufacturing technologies