

## S1 L1

# ANALYTICAL TECHNIQUES APPLIED IN THE STUDY OF IONIC IMPURITIES IN ELECTRICAL ROTATING MACHINES INSULATORS

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Traces of metals (Al, Mn, Fe, Ni, Co, Cu, Zn, Cr, Cd and Pb, have been found in the insulation of cables PE. These transition metals causes degradation of insulation, affect its insulating properties and can lead to undesired electrochemical processes under the electrical stress factor. Concentrations of these elements can be determined only by means of atomic and nuclear techniques of high sensitivity and precision. For elemental analyses we applied the Inductively Coupled Plasma Mass Spectrometry - ICP-MS technique.

**Key words:** insulator, methods, electrical rotating machines.

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## S1 L2

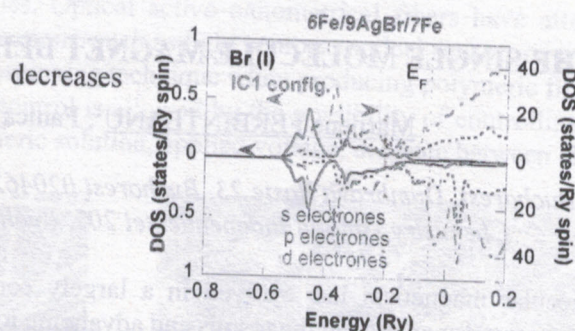
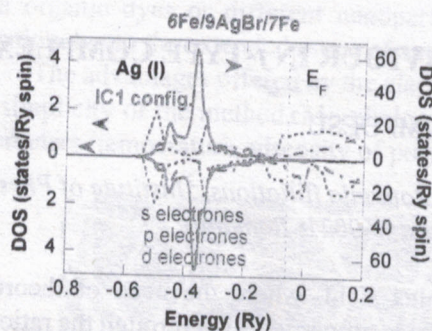
# SPIN POLARIZED TRANSPORT IN Fe/NaBr(001) BASED HETEROJUNCTIONS

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The electronic, magnetic and spin polarized transport properties of Fe/NaBr/Fe(001) heterostructures were investigated by means of ab initio surface Green's function technique for surface and interfaces. Two model interfaces were considered, IC1, with Fe atoms situated atop Na and Br positions and IC2 with Fe atoms sitting above the hollow between Na and Br sites. The total energy calculations showed that sharp Fe/AgCl(001) interfaces are possible. Due to location of iron Fermi level near the bottom of the NaBr conduction band, for both interfaces, there is a charge transfer between the magnetic slabs and spacer and thus formation of metallic induced gap states (MIGs) in the band gap of the barrier, as exemplified in Fig.1 for interfacial Ag(I) and Br(I) layers in IC1 configuration.

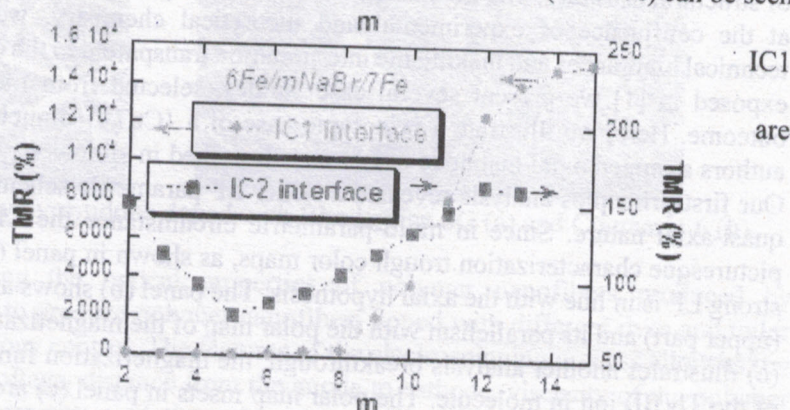




The  
conduction

exponentially with the barrier thickness. High values of the tunneling magnetoresistance ( $> 10^4\%$ ) can be seen in 6Fe/mNaBr/7Fe heterojunctions for spacer thickness  $m > 10$  in the case of configuration. The propagating direct tunneling states along the NaBr spacer of  $\Delta_1$  and  $\Delta_5$  symmetry. The highly magneoresistive effect observed in Fe/NaBr/Fe(001) heterojunctions make this system of interest in the context of spin electronics.

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## S1 L3

### ELECTROCHEMICAL DEPOSITION - A TOOL IN FABRICATING NANOSTRUCTURES WITH TAILORED PROPERTIES

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Electrochemical deposition is a centuries old technique with numerous applications nowadays due to the low costs of equipment and simplicity of operation. Its unicity comes from its extraordinary scalability and its ability of covering nonplanar surfaces.

Electrodeposition of semiconductors was discovered several decades ago and increased the attractiveness of the field. Further, electrodeposition of conducting polymers was discovered and added another dimension to the technique.

When extreme miniaturization became a hot topic it was found that electrodeposition can be exceptionally useful in the preparation of nanostructures with well defined morphologies. Both template and templateless methods of fabrication of nanostructures were developed[1–3].

The presentation will review electrodeposition based approaches in preparing nanostructures for specific applications. The way in which functionality is achieved will be described for several materials including metals, semiconductors and conducting polymers.

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