

Post-doc position (#1/1)

Title: Synthesis of polymer-metal multiferroic materials

Character: Experimental

Context

The combination of magnetic and electrical characteristics from different materials in a single material results in a multiferroic material and a good combination of these features, as for example, the combination of magnetostrictive and piezoelectric phases, can lead to the desired magnetoelectrical properties. The development of a multiferroic material providing good electrical and magnetic properties both at room temperature and at high temperatures is a great advance for modern electronic and multifunctional materials as these materials offer the possibility to obtain new generations of sensors, microwave devices, etc. To get a material having the aforementioned characteristics the use of composite materials has been proposed. The variety of compositions in magnetoelectric composites grows up day by day and already nanocomposites with polymeric structures using conductive polymers and magnetostrictive nanoparticles have been developed. However, its application at high temperatures is still difficult. The design of magnetoelectric composites formed by high temperature piezoelectric polymers and magnetostrictive amorphous metal ribbons is a promising advance for the future development of a new generation of high temperature sensors.

Tasks

- 1-Development and improvement of high temperature piezoelectric polymer synthesis
- 2- Polymer polarization by different methods, corona poling and classical poling.
- 3-Determination of d_{33} and d_{31} piezoelectric moduli
- 4-Implementation of piezoelectric polymers in magnetoelectric composites
- 5-Optimization of magnetoelectric composites for high temperatures

Methods to be used: 1) Synthesis of polyimides by polycondensation; 2) Structural characterization: FTIR, NMR, Elemental Analysis, GPC; 3) Thermal Characterization: DSC, TGA, TGA-Mass; 4) Electrical characterization; 5) Magnetostrictive and magnetoelectric characterization...

Requirements

A PhD on Materials Science, Polymer Science and Technology or similar is required.

Application

Send a CV, motivation letter and two references to jobs@bcmaterials.net

Dead line: August 15th, 2012, 24:00 h GMT