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distribution). Determination of the intermetallic phases in the CGSi allows a better knowledge of the material produced and also can be helpful to improve the research of the material. In this work to make a characterization of the intermetallic phase in the CGSi it was used the technique of Transmission Electron Microscopy (TEM) combined with X-ray Microanalysis. For the analysis of chemical grade silicon using TEM, thin foils must be thickness less than 300 nanometers. The analyzed foils were prepared by mechanical and ionic plishing. The diffraction patterns were used to determine the crystallographic structure of the phases and the bright and dark yield images to characterization of the sample. Combining the techniques of TEM and X-ray microanalysis it was possible to determine binary, ternary and quaternary phases containing the elements: Al,Si,Fe,Ca,O and Ti, presents in the samples.

**RE005-073 - HIGH-TEMPERATURE OXIDATION OF Fe-45%Ta ALLOY -DISTRIBUTION OF SCALES FORMED UNDER DIFFERENT OXYGEN PARTIAL PRESSURES**

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The alloy Fe-45%Ta (weight percent) was obtained from arc melting under argon atmosphere. The starting materials were 99.8% tantalum and 99.98% iron. The alloy ingot was cut into slices with a diamond saw. After polishing with SiC emery paper, samples for oxidation experiments were ready. These samples were oxidized in air and in CO2 - H2 mixtures (providing oxygen partial pressure of 10-24 atm for 600oC and 10-20 atm for 700oC and 800oC) in a thermogravimetric analyser (TGA), for periods of 18 (air) and 24 hours (low oxygen partial pressure). After TGA, oxidized samples were submitted to XRD which revealed that the main oxides formed during air oxidation were iron oxides (Fe2O3 and Fe3O4). For samples oxidized under low oxygen partial pressures there were not found iron oxides, it were analysed tantalum oxides (mainly Ta2O5) and the double oxide FeTa2O6. There were examined the transversal sections of samples at a SEM. This examination showed that there were formed internal and external layers in samples oxidized in air, the latters composed of heamatite, in some cases mixed with magnetite. Under low oxygen partial pressures only internal layers were observed. It was used EDS microprobe to analyse chemical composition of selected areas. These results were compared to those obtained by XRD.

**RE005-076 - CRYSTAL MORPHOLOGY IN BLENDS OF PVDF WITH P(VDF-TrFE)**

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Engineering properties of polymer blends are strongly affected by the miscibility between components. When both components are able to crystallize, complex systems may be formed in which the degree of miscibility can be evaluated by studying individual semicrystalline morphologies and their modifications in the final structure. This paper presents the results of such a study after blending the homopolymer PVDF with its copolymer P(VDF-TrFE). In this case, both components are ferroelectric and very promising for tecnological applications because of their interesting piro- and piezoelectric properties. Blends of different compositions, and containing copolymers of various proportions of VDF and TrFE, were crystallized from the melt at different temperatures and investigated by polarized light and scanning electron microscopy. At higher temperatures, the presence of a liquid copolymer phase interfered strongly with the formation of banded spherulites which is a characteristic feature for PVDF crystallization. At lower temperatures, PVDF spherulites were deformed by the simultaneous crystallization of P(VDF-TrFE) axialites which form the characteristic morphology of the pure copolymer phase. The degree of deformation increased in proportion to the copolymer addition, eventually leading to the complete absence of PVDF spherulites in blends containing 70% of the copolymer phase. Such observations indicate that there is miscibility between PVDF and P(VDF-TrFE) in the liquid state, and that a very intimate mixture of the two phases can be maintained upon crystallization.

**RE005-077 - THE ELECTRON MICROSCOPY FACILITY AT THE LNLS**

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An electron microscopy laboratory (Lab. Mic. Eletrônica, LME/LNLS) was implemented in 1999 in Campinas. This laboratory is organized as a multi-user open facility where the users operate the microscopes by themselves. It includes: a) a 300 kV HRTEM, point resolution 0.17 nm (JEM 3010 URP), including Multi Sacnn CCD camera and X-Ray detector; b) a FEG-SEM (JSM-6330F); and c) a LV-SEM (JSM-5900LV) equipped with X-Ray Microanalysis system. Also, a complete Sample Preparation Laboratory for TEM, and computer image treatment and simulation are available. A simple procedure allows the access to the LME instruments: a short research project must be submitted for evaluation of viability and relevance; after approval the users start training to operate the microscopes. Approximately 80 users from 55 different research groups have been using the facility since its inauguration. The spectra of users cover different fields (chemistry, physics, engineering, etc.) and also a wide variety of instruction levels from technicians, to under- and graduated students, post-docs and professors. This facility has been funded by FAPESP.

**RE005-078 - CHARACTERIZATION OF OXIDIZED CERAMIC COATED CARBON-CARBON BY SCANNING ELECTRON MICROSCOPE**

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A gradient functional coating based on SiC and B4C concentration gradient layer, formed by the use of a pack process, provides an effective antioxidant protection to carbon/carbon composites at intermediate temperatures (below 1000 oC) by a self healing process due the formation of a B2O3 glass from the oxidation of boron phases. Samples of coated bi-directional carbon/carbon composites were heat treated for 3 hours at 800 oC under a dry air flow of 100 ml/min. Scanning electron microscope (SEM) was used to perform a cross section examination of the as-formed and oxidized coating. The B2O3 glass formed from the B4C at the inner layer of the coating flows along the walls of the SiC sealing the inherent cracks due the coefficient of thermal expansion mismatch of the coating material and the carbon substrate.