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### **Matéria, Volume 13 Number 3: Diversified Content**

The Journal Matéria publishes once again in this edition two ensemble of articles, one composed out of articles presented at the PaCOS Network 4<sup>th</sup>. Seminar (PaCOS is the Brazilian Solid Oxide Fuel Cell Network) and another ensemble of articles that were spontaneously submitted to the journal. All of them have gone through the rigorous, but contributing, peer review process, under the responsibility of the journal's Editorial Board.

The group of articles that were written by the PaCOS Network members showed a varied laboratorial activity, aiming to develop materials and components for SOFC. This has included an effort for the controlled fabrication and characterization of SOFC electrolytes, functional electrodes (anode and cathode), as well as the three-dimensional simulation of interconnects.

The conventional, but effective, electrolyte made out of yttria stabilized zirconia – YSZ – was produced under the form of ceramic plates for electrolyte supported cells (11031). In this case it was verified that “the rheological behaviour of suspensions for tape casting is influenced by the content of ligants, being found that the bigger the content of ligants the more enhanced the pseudoplastic behaviour and the viscosity”. Additionally, fabrication methods for this electrolyte under the form of films were evaluated to allow a reduction on the cell operation temperature. One of the articles was more devoted to the technique of spray-pyrolysis (11035) and the other analysed the effect of ligants, through rheological and microstructural characterizations (11030). The modern ceria made electrolyte films for intermediate temperature electrode-supported SOFC have had their electrical properties characterized (11027), as well as a detailed analysis of the effect of aliovalent ions doping, with emphasis on the formation of resistive phases on the interface with the electrode (11028). Ameliorating SOFC operation was also searched by the use of functional electrodes. These were explored for cathode and anode. In one case, a functional layer was introduced between the electrolyte and the conventional cathode with the objective to decrease ohmic and concentration polarizations (11029). In another case (11041), special materials and fabrication methods were developed to allow the direct oxidation of ethanol on the SOFC anode, thus eliminating the expensive process for the previous reforming of ethanol. In addition to these works, an article (11036) has made three-dimensional modelling of interconnect channels adjacent to the anode to evaluate the flow of hydrogen water mixtures.

Among the ensemble of articles submitted spontaneously to the journal, this edition presents two cases of well distinct works involving surface engineering. One of them presents modern CVD procedure for diamond deposition over enlarged areas (10758) and another one (10834) lead us to the traditional Metallurgy, presenting different coatings obtained by painting refractory components used in steel making, with the objective to decrease decarburization. Other metallurgical evaluations of metallic materials are also made. One work makes simulation to estimate the crack size in samples containing weld joints (10897). Other studies show, in one case (10991) the

influence of microstructure on segregation in aluminium based alloys, concluding that finer dendritic arrays lead to smaller corrosion rates than do coarse structures; and in another case (11019), microstructural variations produced by plastic deformation and heat treatments of an AA6061 type aluminium alloy, used for the fabrication of cylinders for compressed natural gas, are presented. There is still an evaluation made for a polymeric material to be used in temporary prosthesis (11015) and an important environmental action was made, showing the possibility for copper electrowinning and cyanide oxidation from wastewaters generated in electroplating plants (11032).

Rio de Janeiro, September 2008

A handwritten signature in black ink, appearing to read 'PEM', with a stylized flourish at the end.

Paulo Emílio Valadão de Miranda  
Editor Chefe