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Characterization of Proton Exchange Membrane Fuel Cell Catalysts

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The structures of the Proton Exchange Membrane Fuel Cells Catalysts were investigated by transmission electron microscopy (TEM), energy dispersive analyses (EDS), X-ray Diffraction (XRD) were used to evaluated the semi-quantitative composition of the catalysts. The electrochemical behavior was analyzed by cyclic voltammetry (CV) and polarization curves (Uxi).

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Ti-13Nb-13Zr foams for surgical implants

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The use of titanium and its alloy as biomaterial is increasing due to their low modulus, superior biocompatibility and enhanced corrosion resistance when compared to more conventional stainless steel and cobalt-based alloys. Ti-13Nb-13Zr is a titanium alloy specifically developed for surgical implants. In this work, highly porous titanium foams, with porosities above from 50%, are reached, using an efficient powder metallurgical process, which includes the introduction of a selected spacer into the starting powders. Samples were produced by mixing of initial metallic powders followed by uniaxial and cold isostatic pressing with subsequent densification. The samples presented a Widmanstätten-like microstructure in an open cellular morphology, with pore size of 200-500 mícrons.

01/14

A Comparison Between CoNiCrAlY Bond Coat And Zirconia Plasma Sprayed Coatings On Creep Tests

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Thermomechanical and electrical properties of zirconia-based ceramics have led to a wide range of advanced and engineering ceramic applications like solid electrolyte in oxygen sensors, fuel cells and furnace elements and its low thermal conductivity has allowed its use for thermal barrier coatings for aerospace engine components. A comparison between CoNiCrAlY bond coat and zirconia plasma sprayed coatings on creep tests of the Ti-6Al-4V alloy was studied. The material used was commercial Ti-6Al-4V alloy. Yttria (8 wt.%) stabilized zirconia (YSZ) with a CoNiCrAlY bond coat was atmospherically plasma sprayed on Ti-6Al-4V substrates by Sulzer Metco Type 9 MB. Constant load creep tests were conducted on a standard creep machine in air on coated samples, at stress levels of 520 MPa at 500°C to evaluate the oxidation protection on creep of the Ti-6Al-4V alloy. Results indicate that the creep resistance of the ceramic coating was greater than metallic coating.