... increasing and robust adaptation level for the forecasting process. This work is part of a major project for developing a photovoltaic systems manager.

Keywords: Photovoltaic systems, solar energy, energy efficiency, battery, forecast system.

B-117

Pt-RARE EARTH ELECTROCATALYSTS FOR PROTON EXCHANGE MEMBRANE FUEL CELL

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Electrocatatalysts containing PtSm, PtTb and PtDy nanoparticles supported on high surface area carbon were synthesized by the colloid method developed by Bönemann and were characterized by Energy Dispersive Analysis (EDS), Transmission Electron Microscopy (TEM) and Cyclic Voltammetry (CV). The electrocatalysts were tested for methanol and ethanol electro-oxidation using the thin porous coating electrode technique. The results for methanol and ethanol electro-oxidation show that all the binary electrocatalysts investigated increase the oxidation current values when compared to pure Pt and the best results were obtained using a PtDy electrocatalyst.

Keywords: electrocatalystic, fuel cell, ethanol, methanol, rare earth elements

B-118

OPTIMIZATION STUDIES ON PEM FUEL CELL USING RESPONSE SURFACE METHODOLOGY

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Optimization of fuel cells operation is very desirable from economical point of view, since the energy production by fuel cells should be maximized. To obtain an optimized fuel cell performance under various experimental conditions, electrochemical impedance spectroscopy (EIS) was used under dynamic load in order to evaluate the resistence of Proton Exchange Membrane Fuel Cell (PEMFC) under practical operation conditions. The experiments were carried out using a PEMFC unit assembled with a commercial E-TEK MEA (Membrane Electrode Assembly). The results were analyzed by the statistical methodology of response surface (star central composite) optimizing the process operational parameters at PEMFC. The chosen operational parameters to evaluate the PEMFC process were: working temperature at the cell unit, inlet gas flow and humidifying temperature, keeping the working current in the range of 2.5 A. An important dependent variable, measured during the trials, was fuel cell voltage, collected at steady state, after achieving the EIS spectrum. The voltage result, following Ohm's Law, is an indirect measure of total PEMFC resistance against the occurring electrochemical reactions developed inside the fuel cell, since the current was kept constant during the experiments. The low frequency impedance module, at Bode Diagram, is an indicative of PEMFC total resistance. To get some representation of chemical kinetics at PEMFC, the inflection frequency and inflection angle at Bode diagram phase angle curve were also taken as dependent variables. The data were treated electronically by statistical software and the response surfaces were obtained, showing optimized results for an specific MEA.

he results are indicative to achieve better performance when the working temperature tends to be around 70-80°C, with lower as flow, less than 120 mL/min H_2. The humidifying temperature seemed to have no greater influence in the experimented range.

eywords: PEMFC, hidrogen, fuel cell

3-119

ENERGY QUALITY OF DISTRIBUTED GENERATION WITH PV GRID-CONNECTED SYSTEMS AT USP: Evaluation of supply parameters

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The paper present results obtained from the evaluation of the parameters regarding energy quality, supplied by the 0.3 Wp grid connect PV system installed in the building administration of the Electrotechnical and Energy Institute of São Paulo

The results obtained show the need to perform systematic studies to get experience and background to work with the [illegible] to the grid

[illegible] Distributed Generation Operation Characteristics [illegible] and reactive

3-132

A PROPOSAL TO THE PERFORMANCE OF PHOTOVOLTAIC SYSTEMS CONNECTED TO THE UTILITY POWER GRID

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Among the energy forms used to substitute the conventional electricity generation methods, the photovoltaic solar nversion is one of the most interesting alternative. In fact, this option may be justified because of some advantages such as wer losses, higher efficiency and longer useful lifetime than others similar energy sources. However, the operation of such [illegible] be optimized in order to make it even more competitive. Within this context, this work aims to develop a control uipment to search for the maximum power operation of a photovoltaic system connected to the power grid. PWM (Pulse Width odulation) technique is used to adjust the DC side voltage to the point of maximum power absorbed by the AC system, timizing the operation of the photovoltaic generator at any sunstroke level. Some results are shown to confirm its efficacy of e proposed solution.

eywords: Photovoltaic Solar Energy, Distrubuted Generation, PWM Inverter

3-133

OPTIMIZATION STUDIES ON PEM FUEL CELL USING RESPONSE SURFACE METHODOLOGY

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