thickness and the amount of platinum nanoparticles deposited is very low in comparison with commercial fuel cells (70% less).

Some factors beyond of carbon layer thickness used corroborated with low cell performance compared to a commercial fuel cell. As this study we evaluated the possibility of nanoparticles application, the gas flow control as well as humidification were not satisfactory to achieve maximum performance. Due to no correct control of humidity, the water concentration inside of membrane pores was very high and then the channels were clogged not allowing the gas flow. When the channels were free again, the flow gas passed easily increasing the current to approximately 0.8 ampere but the gas drag water again clogging the channel and decreasing the efficiency of cell.

V. Conclusion

The results obtained showed that the combination of pressure and adequate power is possible to control the size and shape of the nanoparticles while in addition the time influences the amount of deposited nanoparticles. Thus, one can obtain nanoparticles with sizes from 10 to 300 nm and well defined shapes arranged linearly allowing an increase in performance when considering application in fuel cells due to a better interaction of the gas with the catalyst – platinum. The results shown that using devices with better control of gas flow, humidification of the cell and temperature control can be achieved even higher performance, indicating the process the plasma as a good alternative to produce platinum nanoparticles for fuel cells.

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R. D. Mansano born in São Paulo, Brazil in 02/17/1964. He holds a degree in Physics from the Pontifical Catholic University of São Paulo (1991), a Master's degree in Metallurgical Engineering from the University of São Paulo (1993), a PhD in Electrical Engineering from the University of São Paulo (1998) and a PhD in Electrical Engineering from University of São Paulo São Paulo (2002).
He is currently Associate Professor at the University of São Paulo. He has experience in Electrical Engineering, with emphasis on Materials and Components Semiconductors. He worked with electron beam lithographic processes, thick polymers, micro-molding, LIGA processes. In 2010 she completed a postdoctoral project in the manufacture of nanostructured fuel cell membranes. In addition, he has experience in the deposition and characterization of diamond-type carbon films (DLC), magnetron sputtering and CVD deposition processes, plasma processes and thin films for application in several areas. In addition, it has knowledge of characterization techniques such as Raman spectroscopy, FTIR, scanning electron microscopy, atomic force microscopy, electrical characterization, structural, mechanical (microhardness). Prof. Mansano is the coordinator of the nanotechnology application in University de São Paulo, he has a expressive scientific production with 300 full paper published and six industrial patents.

A. P. Mousinho born in São Paulo, Brazil, in 10/31/1976. She holds a postdoctoral degree from, the Institute of Physics of the University of São Paulo (2006-2009). This title was obtained in a joint work with the Polytechnic School of the University of São Paulo and the work consisted in the deposition and characterization of carbon nanotubes and nanostructured carbon films for the manufacture of sensors, electronic devices, microfabrication and biomedical applications. She holds a PhD in Electrical Engineering from the Polytechnic School of the University of São Paulo (2005), where he worked with Diamond-like carbon films, their applications and characterizations. She holds a Masters in Electrical Engineering from the Polytechnic School of the University of São Paulo (2001) and holds a degree in Materials, Processes and Electronic Components from the Faculty of Technology of São Paulo (1998).
She worked with electron beam lithographic processes, thick polymers, micro-molding, LIGA processes. In 2010 she completed a postdoctoral project in the manufacture of nanostructured fuel cell membranes. In addition, she has experience in the deposition and characterization of diamond-type carbon films (DLC), magnetron sputtering and CVD deposition processes, plasma processes and thin films for application in several areas. In addition, it has knowledge of characterization techniques such as Raman spectroscopy, FTIR, scanning electron microscopy, atomic force microscopy, electrical characterization, structural, mechanical (microhardness), among others Dra. Mousinho have an expressive scientific production with about 50 full papers published.

N. Ordonez born in São Paulo, Brazil, in 05/31/1972. He holds a degree in Chemical Engineering - FACULDADES OSWALDO CRUZ (1998) and a degree in Project Management from Universidade Paulista (2008). He is currently a laboratory specialist at the University of São Paulo. He has experience in Electrical Engineering, with emphasis on Materials and Components Semiconductors, working mainly in the following subjects: Plasma Corrosion, sterilization, plasma sterilization, sputtering, cvd, x-ray, special gases, profilometry and ellipsometry, mechanical conformation.

A. J. Moreira born in São Paulo, Brazil, in 01/01/1969. He holds a Bachelor's degree in Sciences with qualification in chemistry - Faculdades Oswaldo Cruz (1996), a Master's Degree in Pharmaceuticals and Medicines from the University of São Paulo (2006) and a PhD in Electrical Engineering from the University of São Paulo (2013). Post doctorate in sciences from the University of São Paulo (2015).
He is currently a researcher at the University of São Paulo. in Chemical Engineering, with emphasis on Operation of Chemical Deposition Equipment and X-ray Analyses, scanning electron microscopy, fluorescence X-ray analyses, working mainly in the following subjects: plasma, fuel cells, nanoparticles, renewable energy and platinum.