

## PLATINUM NANOPARTICLES OVER SINGLE-WALLED CARBON NANOTUBES AS FUEL CELLS CATALYSTS

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The impact of the Nanotechnology in Fuel Cell Technologies is attracting an increasing interest. The development of new hydrogen storage nanomaterials, nanocomposites for polymeric membranes and carbon plates and catalyst nanoparticles is being addressed in an increasing number of papers. Due to their high surface area, carbon nanotubes are being used as catalyst support. In this paper we report the preparation of platinum nanoparticles on single-walled carbon nanotubes (SWNTs) and their utilization as fuel cells catalysts.

SWNTs have been prepared by the electric-arc discharge method using Ni / Y (2 / 0.5 at.%) as catalyst in the graphite precursor. Then, SWNTs were added to a platinum-salt solution in toluene under inert atmosphere, so a final SWNT-Pt 1:1 wt% composition was obtained.

The changes induced in the sample of SWNTs and through the reaction with Pt nanoparticles have been followed by induced coupled plasma spectroscopy (ICPS), X-ray diffractions (XRD) (Fig.1), transmission electron microscopy (TEM) (Fig.2) and extended X-ray absorption fine structure spectroscopy (EXAFS).

The characterization of electroodic structures was performed through the polarization curves in pure humidified H<sub>2</sub> and O<sub>2</sub> (99,9996 and 99,999% respectively) in a 16 cm<sup>2</sup> monocell at 70°C and atmospheric pressure. The data acquisition was achieved using LabView software and an Amrel electronic load.

### References:

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## Figures:

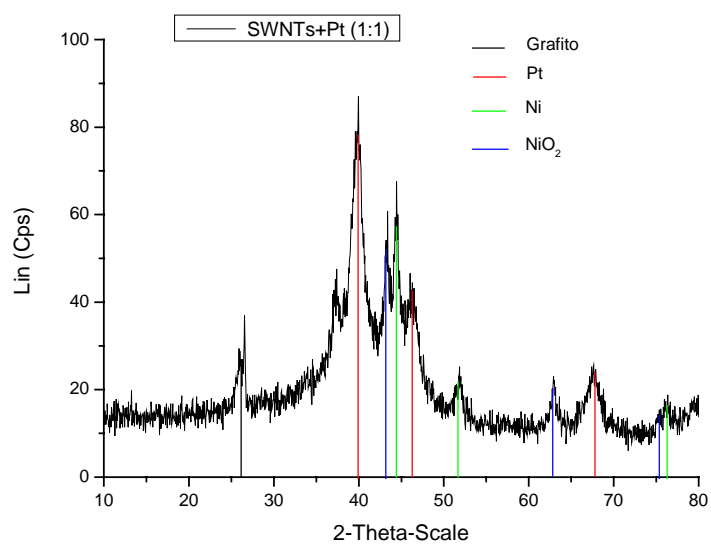


Fig.1: XRD pattern of SWNTs-Pt 1:1 wt%

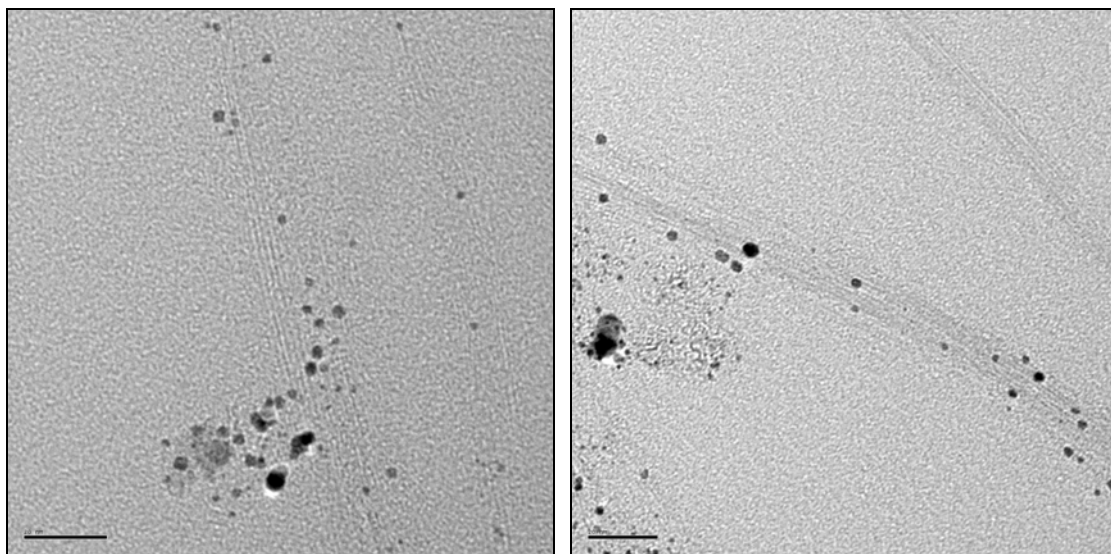


Fig.2: TEM images of SWNTs and Pt nanoparticles