

FUEL CELLS 2006

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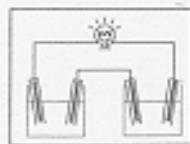
Scientific Advances in Fuel Cell Systems

13-14 September 2006 • Turin, Italy

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CHIMET[®] electrocatalysts for polymer electrolyte fuel cell

A. Pozio^{*1}, M. De Francesco¹, A. Cemmil¹, M. Cerboni^{2,2}, R. Pellegrini², M. Graziani²

¹ENEA, C.R. Casaccia, Via Anguillarese 301, 00060, S. Maria di Galeria (Rome), Italy, alfonso.pozio@casaccia.enea.it, ²CHIMET S.p.A., Via di Pesciola 74, 52040 Vicinaggio (Arezzo), Italy.

Platinum on carbon was prepared from carbonaceous material, H_2PtCl_6 and sodium formiate as reducing agent [1] while Pt-Ru/C was prepared always on carbon support but using $Pt(NH_3)_4Cl_2/RuNO(NO_3)_x(OH)_y$ and borohydride as reducing agents [2]. In both cases a very fast reduction process of the metal was used by means of a proprietary method based on ENEA¹ technology. Small and homogeneously dispersed catalyst particles were obtained. XRD and electrochemical measurements show that the performance of catalysts prepared was similar to those of commercial one but with increased stability. In particular long-term test carried out on Pt/C in a polymer electrolyte fuel cell for thousands of hours showed very good performance. The proprietary method allows a very fast reduction kinetic of metal ions, with reduced thermal and diffusive gradients, and permits the production of more homogeneous catalysts.

The Pt-Ru catalyst produced is a real 50:50 at.% alloy with much more crystalline phase with respect to commercial sample. The electrochemical performances in hydrogen or methanol and the CO tolerance are similar to those of commercial catalyst [3]. In addition, the new catalyst is much more stable in ethanol and methanol even if heated or ultrasonicated.

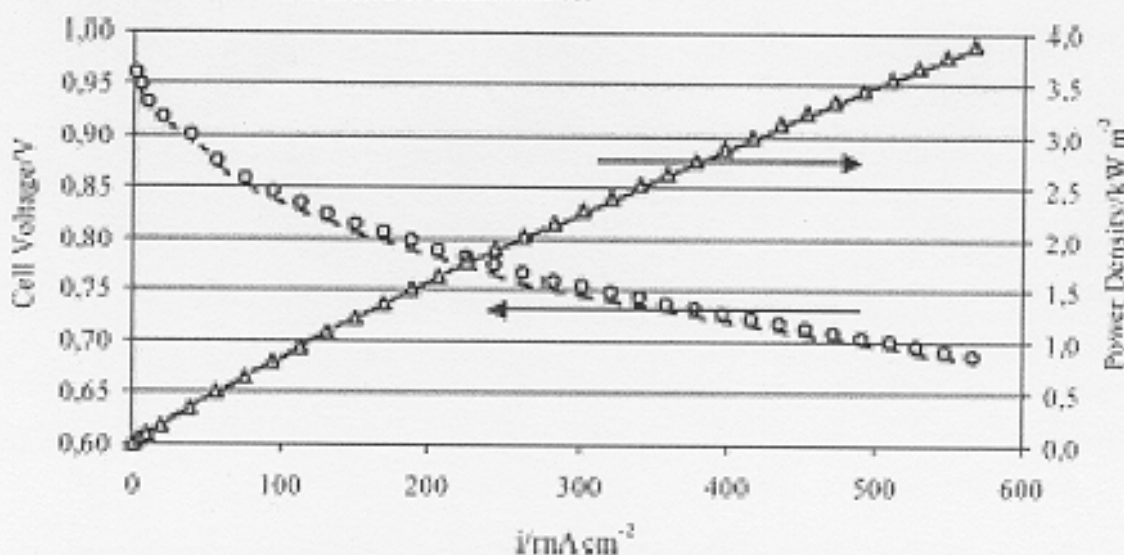


Fig. 1 - Cell voltage and power density versus current density of cells with the Chimet (○ and △) and commercial (--- and —) Pt-Ru/C catalysts at the anode side, $T_{cell}=75^{\circ}C$ under H_2 and O_2 streams (1.4/1.4 abs. bar)

Keywords: Catalysts, fuel cell, PEFCs.

References:

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- 3) R.F. Silva, M. De Francesco, L. Giorgi, M.C. Campa, F. Cardellini, A. Pozio, *J. Solid State Electr.*, **8**(8), (2004), 544-549.

¹ ENEA is the Italian National Agency for New Technologies, Energy and the Environment