



Hydrogen Europe: European Hydrogen & Fuel cell Project Database

Project NANO-CAT

Development of advanced catalysts for PEMFC automotive applications

Many efforts have been put on the reduction of the Pt loading but nowadays a threshold seems to be obtained. Because the kinetics of the Hydrogen Oxidation Reaction is very fast on Pt, it is possible to use MEA with a Pt loading as low as 35 $\mu\text{gPt}/\text{cm}^2$ without any effect on the voltage loss when such an anode is used in front of a well working cathode. But, the Oxygen Reduction Reaction kinetics is not so fast which is the limiting step concerning the electrochemical processes in a PEMFC. For that reason, the decrease of the Pt loading is now encountering a plateau. Nano-CAT will propose alternatives to the use of pure Pt as catalyst and promote Pt alloys or even Pt-free innovative catalyst structures with a good activity and enhanced lifetime due to a better resistance to degradation. Nano-CAT will thus develop novel Pt-free catalysts (called bioinspired catalysts) and explore the route of nanostructured Pt alloys with very low Pt content. Catalysts are chemical species on which the electrochemical reactions are accelerated. PEMFC uses heterogeneous catalysis meaning the catalyst needs to be supported on a material in a solid phase (catalyst support). Nano-CAT will focus on the development of new supports with 2 promising sets of solutions: functionalized Carbon NanoTubes and conductive carbon-free Metal Oxide. These supports offering a better resistance towards degradation than the carbon black commonly used will address the issue of the support degradation and the MEA lifetime. Nano-CAT will follow two routes, one low risk to ensure demonstration of the use of Pt alloys on new resistant supports and one high risk route to evaluate the feasibility of Pt-free MEA based on the use of bioinspired catalysts. Finally, Nano-CAT addresses all technical issues leading to the industrialization of the project outcomes for automotive application by the development of high quality manufacturing methods of complete MEAs required to maintain high power density and efficiency.

Project Information

Type of project : Research

Timing : 01/05/2013 > 31/01/2017

Project website: <http://nanocat-project.eu/>

Project Budget : 4.394.331 €

Funding

European Union through FCH JU: Grant agreement 325239 - [CORDIS link](#)

Project partners

Coordinator :

[CEA - Commissariat à l'énergie atomique et aux énergies alternatives](#)

Partners :

[MINES ParisTech/ARMINES PERSEE](#)

[TECNALIA](#)

[DLR - German Aerospace Center](#)

[Volvo Group](#)

[NANOCYLSA](#)

[JRC -JOINT RESEARCH CENTRE- EUROPEAN COMMISSION](#)

[C-TECH INNOVATION LIMITED](#)

[Sub project\(s\)](#)

Sub project 1

Country: France

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Sub project categories

Research

Project Id: 1050

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