

# Nano-CAT

## Development of advanced catalysts for PEMFC automotive

### Duration:

01 May 2013 to 30 Apr 2016

### Application Area:

Transport and refuelling infrastructure

### Budget:

Total: 4,394,330 €

FCH contribution: 2,418,439 €

### Partnership / consortium list:

CEA (Fr), Armines (Fr), Tecnalia (Es), Nanocyl (Be), JRC (Be), C-Tech Innovation Ltd (UK), DLR (De), Volov Technology (Se)

### Summary / main objectives of the project:

The main objective of Nano-CAT is to decrease the Pt catalyst loading in MEA and thus price of PEMFC system. The

followed routes to succeed in are:

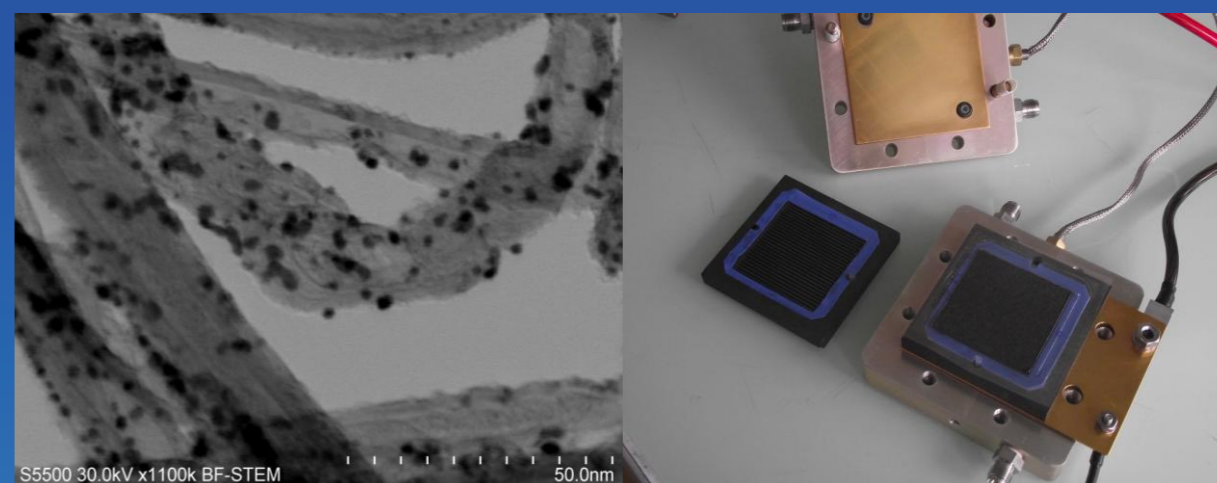
- development of nanostructured innovative catalysts (Pt free and Pt alloy) which give higher mass activity than Pt.
- development of resistant supports which decrease degradation of the Active Layer and increase the life time of MEA.

### Technical accomplishment / progress / result:

- Synthesis of Pt based catalysts on CNT
- Synthesis of Pt free catalysts for HOR and ORR.

### Future Steps:

- 1 – integration of the as prepared catalyst in MEA
- 2 – set up AST test to quantify the improvement in performance/durability thanks to our catalysts/supports
- 3 – integration of the best ones in stack



### Contribution to the Programme Objectives:

Call: SP1-JTI-FCH.2012.1.5	OBJECTIVES OF THE CALL	OBJECTIVES OF THE PROJECT	CURRENT STATUS
<b>Pt loading</b>	0.1 g/kW	0.1 g/kW @ max 0.3 g/kW @ 55% yield	0.25 g/kW @max 0.8 g/kW @ 55% yield
<b>Power density</b>	1 W/cm <sup>2</sup> @ 1.5 A/cm <sup>2</sup>	1 W/cm <sup>2</sup> @ 1.5 A/cm <sup>2</sup>	0.750 W/cm <sup>2</sup> @ 1.5 A/cm <sup>2</sup>
<b>Life time</b>	>5,000 h	10 % degradation at 5,000 h	N/A
<b>Cost of PEMFC system</b>	100 €/kW	Not defined	N/A

### Conclusions, major findings and perspectives:

At this early stage of the project we succeed in synthesis of Pt free catalyst and Pt containing catalyst on resistant support with an acceptable mass activity and electrochemical surface area. The next step is the integration in MEA and test in single cell.