



Hydrogen Europe: European Hydrogen & Fuel cell Project Database

Project DURAMET

Improved Durability and Cost-effective Components for New Generation Solid Polymer Electrolyte Direct Methanol Fuel Cells

The main objective of the DURAMET project is to develop cost-effective components for direct methanol fuel cells (DMFCs) with enhanced activity and stability in order to reduce stack costs and improve performance and durability. The project concerns with the development of DMFCs for application in auxiliary power units (APU) as well as for portable systems. The target temperature for DMFCs in APU applications is 120-130 °C. To overcome the methanol cross-over and dehydration problems of perfluorosulphonic membranes, such as Nafion, or the slow start-up and electrolyte leaching in hot methanol solution of phosphoric acid-doped polybenzimidazole membranes, the efforts for APU applications will be focused on new polyphosphonic acid functionalised polymers. Cost-effective sulphonated polysulfone hydrocarbon membranes with better resistance than Nafion to methanol cross-over as well as to the drag of Ru ions will be developed for portable applications. For both applications improved durability electro-catalysts will be developed with the aim to reduce costs, degradation and noble metals content. The work will address the development of cost-effective Pd catalysts or noble metal-free materials, the latter especially for high temperature applications. These systems will be dispersed on Ti-suboxides supports in order to stabilize the metallic phase through a strong metal-support interaction (SMSI). This will reduce electrochemical corrosion phenomena which in most cases are promoted by the degradation of carbonaceous supports. To validate the new membranes and electro-catalysts materials, specific development of membrane-electrode assembly will be carried out with tailored hydrophobic-hydrophilic electrode characteristics. The new developed components will be thus validated in short stacks to assess their performance and durability under practical operation. Specific attention will be devoted to the exploitation, dissemination and the training of young researchers.

Project Information

Type of project : Research

Timing : 01/12/2011 > 30/11/2014

Project website: <http://www.duramet.eu/>

Project Budget : 2.956.874 €

Funding

European Union through FCH JU: **Grant agreement 278054 - CORDIS link**

Project partners

Coordinator :

[CNR - Consiglio Nazionale delle Ricerche](#)

Partners :

[CNRS - Centre National de la Recherche Scientifique](#)

[EWII Fuel Cells A/S \(previously IRD\)](#)

[Politecnico di Torino](#)

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TECHNISCHE UNIVERSITAET MUENCHEN

PRETEXO

JRC - JOINT RESEARCH CENTRE - EUROPEAN COMMISSION

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

Sub project 1

Country: Italy

Address:

PIAZZALE ALDO MORO 7 00185 ROMA

Sub project categories

Research

Project Id: 951

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