Hydrogen Europe:
European Hydrogen & Fuel cell Project Database

Project MAESTRO

MembrAnEs for STationary application with RObust mechanical properties

Low equivalent weight ionomers are required to reach the membrane conductivity and MEA performance targets for stationary operation and enable stationary PEMFC systems to achieve superior overall system yield to competitive technologies. Perfluorosulfonic acid ionomers (PFSA) demonstrate excellent properties in terms of chemical resistance in a fuel cell environment. In stationary applications, where the situation of deep MEA dehydration and frequent open circuit voltage events can be reasonably avoided, (this is not true in automotive applications) the most relevant failure mode in extended life time operation is associated with membrane mechanical failure. The use of a pre-formed inert support for mechanical stabilisation within the membrane has the drawback of reducing membrane specific conductivity, and this frequently imposes a reduction in membrane thickness to very low values. The objective of this proposal is to improve the mechanical properties of low equivalent weight state of the art perfluorosulfonic acid membranes using chemical, thermal, and processing and filler reinforcement methodologies by maintaining high proton conductivity. The baseline product for further development is the short side chain perfluoroionomer that already shows the best combination between ionic conductivity and mechanical stability. Stabilised membranes will be comprehensively characterised for their ex situ properties and screened and selected membranes will be integrated into MEAs and validation by evaluating single cell performance and durability under conditions relevant for stationary operation and comparison with those of reference membrane materials and MEAs, including the development and application of accelerated stress testing. In the final phase of the project the most promising membranes will be tested in a 4000 h durability test, simulating 10% of the expected lifetime of a stationary system to have a realistic projection of the expected degradation at 40,000 h.

Project Information

Type of project : Research
Timing : 01/01/2011 > 31/03/2014
Project website: http://www.maestro-fuelcells.eu/
Project Budget : 2.264.765 €

Funding

European Union through FCH JU: **Grant agreement 256647** - **CORDIS link**

Project partners

Coordinator :
CNRS - Centre National de la Recherche Scientifique
Partners :
Johnson Matthey Fuel Cells Limited
MAESTRO
SOLVAY SPECIALTY POLYMERS ITALY S.P.A.
PRETEXO

Sub project(s)

Sub project 1

Country: France
Address:
Rue Michel -Ange 3 75794 PARIS
Sub project categories
Research

Project Id: 1039
This project datasheet was last updated on : 21.11.2017
Modify this project datasheet