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New Anion Exchange Membrane Electrolysers

GRANT AGREEMENT No. 875024

Anion Exchange Membrane Electrolysis for Renewable Hydrogen Production on a Wide-Scale

ANIONE – Deliverable Report

D4.3 – Publishable report on electrocatalysts and recombination catalyst development for AEM electrolysis

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Publishable summary

The deliverable 4.3 concerns the development of critical raw materials-free (CRM-free) electrocatalysts for water electrolysis based on anion exchange membranes (AEM). A NiFe-oxide electrocatalyst was used at the anode whereas a series of metallic electrocatalysts was investigated for the cathode, such as Ni, NiCu, NiMo, NiMo/KB. These were compared to a benchmark Pt/C cathode. CRM-free anode and cathode catalysts were synthesized with a crystallite size of about 10 nm. Among the CRM-free cathodes, the NiMo/KB catalyst showed the best performance in the AEM electrolysis cell achieving a current density of 1 A cm^{-2} at about 1.8 V/cell when it was used in combination with a NiFe-oxide anode and a 50 µm thick Fumatech FAA-3-50® hydrocarbon membrane. Post operation analysis of electrocatalysts after specific durability tests allowed better comprehension of the modifications occurring with time. Preliminary studies about a recombination catalyst approach are also reported.

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Project partners:

#	Partner	Partner Full Name
1	CNR-ITAE	CONSIGLIO NAZIONALE DELLE RICERCHE
2	CNRS	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE
2.1	UM	UNIVERSITE DE MONTPELLIER
3	POCELLTECH	POCELL TECH LTD
4	TFPH (PV3)	TFP HYDROGEN PRODUCTS (FORMALLY PV3 TECHNOLOGIES LTD)
5	IRD	IRD FUEL CELLS A/S
6	HYDROGENICS	HYDROGENICS EUROPE NV
7	UNR	UNIRESEARCH BV

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