

Curriculum Vitae - Stefania Siracusano

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Position: senior researcher at the CNR Institute for Advanced Energy Technologies “Nicola Giordano” (CNR-ITAE) of Messina.

Degree in Chemistry at the University of Messina (2000).

Ph. D. in "Materials for Environment and Energy" at the University of Tor Vergata-Roma (2009).

Expertises: Energy and transport with reference to hydrogen production systems, fuel cells, electrochemistry, ceramic materials, chemical-physical characterization.

Author of about 50 articles on International Journals, 2 international patents and 2 chapter books. She has participated at different international and national conferences and workshops. She has been a referee for several international journals.

National Project responsibility: Currently responsible in the national Project IEMAP, – Materiali Avanzati per l’Energia. accordo di programma enea-cnr (dsctm) per la regolamentazione dei rapporti in relazione allo svolgimento di attività di ricerca nell’ambito del “programma mission innovation” (cup b82c21001820001) WP3, of several activities: LA3.4: Catalizzatori innovativi a basso contenuto di Critical Raw Materials (CRM) e/o CRM-free per le reazioni di evoluzione di ossigeno e di idrogeno in elettrolizzatori a membrana polimerica (PEM); LA3.5: Sviluppo di assemblati membrana-elettrodi (MEA) e loro caratterizzazione preliminare in elettrolizzatori PEM; WP3 – LA3.6: Valutazione delle prestazioni e della durata dell’elettrolizzatore PEM (2021-2024); in the “accordo di programma mite – enea per la regolamentazione dei rapporti in relazione allo svolgimento di attività di ricerca nell’ambito del piano nazionale di ripresa e resilienza (pnrr) – missione 2 “rivoluzione verde e transizione ecologica” – componente 2 “energia rinnovabile, idrogeno, rete e mobilità sostenibile” – investimento 3.5 “ricerca e sviluppo sull’idrogeno”, finanziato dall’unione europea – next generation eu- CUP B93C22000630006”, of the activity: LA1.1.7 Sviluppo di materiali e componenti con ridotto contenuto di metalli preziosi per elettrolizzatori protonici (PEM) basati su membrane innovative operanti anche ad elevata pressione differenziale (2022-2025).

Current European Community Project responsibility: for CNR of “Redox-mediated economic, critical raw material free, low capex and highly efficient green hydrogen production technology (REDHY) (HE, GA n. 101137893).

Current European Community project: She is involved in different projects financed by European Community called: “Advanced High Pressure and Cost-Effective PEM Water Electrolysis Technology” – ADVANCEPEM (HE Grant Agreement No 101101318); “New manufacturing approaches for Hydrogen Electrolysers to provide Reliable AEM technology based solutions while achieving Quality, Circularity, Low LCOH, high Efficiency and Scalability” – HERAQCLES (HE GA n. 101111784); “Economic green hydrogen production at scale via a novel, critical raw material free, highly efficient and low-capex advanced alkaline membrane water electrolysis technology” HYSCALE (HE G.A. n. 101112055).

European Community project: She was participated to different projects financed by European Community called: “Cost-effective PROton Exchange MEmbrane WaTer Electrolyser for Efficient and Sustainable Power-to-H₂ Technology” – PROMET H₂ project (Grant Agreement No 862253) ; “Next Generation PEM Electrolyser under New Extremes” - NEPTUNE project (Grant Agreement No 779540); High performance PEM Electrolyzer for Cost-Effective Grid Balancing Applications” (HPEM2GAS) - Project funded by the European Community within the H2020 – JTI – FCH – 2015 – 1. No. 700008; “Enhanced performance and cost-effective materials for long-term operation of PEM water electrolysers coupled to renewable power sources” (ELECTROHYPEM), FP7 Project No. 300081. “Quasi-anhydrous and dry membranes for next generation fuel cells (Quasidry) FP7 Project No. 256821; “Improved Durability and Cost-effective Components for New Generation Solid Polymer Electrolyte Direct Methanol Fuel Cells” (DURAMET), FP7 Collaborative Project No. 278054, Call FCH-JU-2010-1;

She was the coordinator of 2 bilateral projects, the first between CNR and ASRT (Egypt), for the duration of 4 years (2 of the project and 2 of the renewal), which had as its objectives the optimization of the energy conversion and storage system consisting of a regenerative cell (SPE). The second between CNR and DIGST (Korea) for the duration of 2 years, which aims to develop and optimization of catalytic electrodes for PEM water electrolyzers.

She took part in several national projects such as FISR, FIRB PON, POR and MSE, and few private contracts of partnership such as Pirelli Labs, Ansaldo Fuel Cell S.p.A, De Nora Tecnologie Elettrochimiche and Tozzi Renewable Energy S.p.A

Bibliometric indicators related to publications and citations:

Scopus : Documents 59; Citations 2790; h-index 30.

Publications of the last 5 years:

- Stefania Siracusano, Fausta Giacobello, Stefano Tonella, Claudio Oldani and Antonino S. Aricò. Ce-radical Scavenger-Based Perfluorosulfonic Acid Aquivion® Membrane for Pressurised PEM Electrolyzers. *Polymers*, 2023, 15, 3906
- S. Siracusano, F. Giacobello, A. S. Aricò. Ag/Ti-suboxides as non-PGM anode electrocatalyst for PEM water electrolysis. *Journal of Power Sources* 565 (2023) 232903. <https://doi.org/10.1016/j.jpowsour.2023.232903>
- S. Siracusano, F. Pantò, S. Tonella, C. Oldani, A. S. Aricò. Reinforced short-side-chain Aquivion® membrane for proton exchange membrane water electrolysis. *International Journal of Hydrogen Energy*, 47(35), 2022 pp. 15557-15570 <https://doi.org/10.1016/j.ijhydene.2022.03.061>
- S. Siracusano, S. Trocino, N. Briguglio, F. Pantò, A. S. Aricò. Analysis of performance degradation during steady-state and load-thermal cycles of proton exchange membrane water electrolysis cells. *Journal of Power Sources* 468 (2020) 228390
- N. Briguglio, F. Pantò, S. Siracusano, A.S. Aricò. Enhanced performance of a PtCo recombination catalyst for reducing the H₂ concentration in the O₂ stream of a PEM electrolysis cell in the presence of a thin membrane and a high differential pressure. *Electrochimica Acta* 344 (2020) 136153
- F. Pantò, S. Siracusano, N. Briguglio, A. S. Aricò. Durability of a recombination catalyst-based membrane-electrode assembly for electrolysis operation at high current density. *Applied Energy* 279 (2020) 115809
- S. Siracusano, C. Oldani, M. A. Navarra, S. Tonella, L. Mazzapioda, N. Briguglio, A. S. Aricò. Chemically stabilised extruded and recast short side chain Aquivion® proton exchange membranes for high current density operation in water electrolysis. *Journal of Membrane Science* 578 (2019) 136-148
- N. Briguglio, S. Siracusano, G. Bonura, D. Sebastián, A. S. Aricò. Flammability reduction in a pressurised water electrolyser based on a thin polymer electrolyte membrane through a Pt-alloy catalytic approach. *Applied Catalysis B: Environmental* 246 (2019) 254-265

Patents:

1. S. A. Aricò, L.R. Gullo, D. La Rosa, S. Siracusano, A.B. Lopes Corriera Tavares, A. Sin Xicola. Ceramic Anode Solid Oxide Fuel Cell.

2004 WO200438844

2005 EPI554770

2006 PCT/EP03/11639

2. S. A. Aricò, L.R. Gullo, D. La Rosa, S. Siracusano, A.B. Lopes Corriera Tavares, A. Sin Xicola. Solid Oxide Fuel Cell with cermet Cu/Ni Alloy Anode.

2004 WO2004049491