

# MARCO ZEPELLI

## Curriculum Vitae

### Part I - a – General Information

Full Name	Marco Zeppilli
SCOPUS ID	55700705900
ORCID	0000-0002-4470-9666

### Part II – Education

Type	Year	Institution	Notes
University graduation	2009	University of Rome Sapienza	Bachelor Degree Industrial Chemistry (509)
University graduation	2012	University of Rome Sapienza	Master Degree Industrial Chemistry (LM-71)
PhD	2016	University of Rome Sapienza	PhD in Chemical and Processes Engineering (XXVIII cycle)

### Part III – Appointments

#### IIIA – Academic Appointments

Start	End	Institution	Position
1-01-2016	31-01-2017	CIABC University of Rome Sapienza	Post-doc scholarship
1-02-2017	14-11-2021	Department of Chemistry University of Rome Sapienza	Post-doc researcher
15-11-2021	current position	Department of Chemistry University of Rome Sapienza	Assistant Professor (RTD-a)

#### IIIB – Other Appointments

Start	End	Institution	Position
12/06/2017	12/07/2017	University of Saint Augustin Arequipa, Peru	Visiting scientist
23/10/2023	current position	6TMIC Engeniers Toulouse - Laboratoire de Genie Chimique (LGC) Toulouse	Visiting researcher

### Part IV – Teaching experience

Year	Institution	Lecture/Course
2020/2021	Department of Chemistry University of Rome Sapienza	Lecturer - PROCESSI E IMPIANTI II (SSD ING-IND/25) – 3CFU - Industrial chemistry (L-27)
2021/2022	Department of Chemistry University of Rome Sapienza	Assistant professor - PROCESSI E IMPIANTI II (SSD ING-IND/25) – 3CFU- Industrial chemistry (L-27)
2022/2023	Department of Chemistry University of Rome Sapienza	Assistant professor - PROCESSI E IMPIANTI I (SSD ING-IND/25) – 6 CFU- Chemical Science (L-27)
2023/2024	Department of Chemistry University of Rome Sapienza	Assistant professor - PROCESSI E IMPIANTI I (SSD ING-IND/25) – 6 CFU- Chemical Science (L-27)
2022	University of Rome Sapienza	PhD supervisor in the Doctorate school "Chemical processes for industry and environment"
2022	Universitat Autònoma de Barcelona	External referee for the PhD thesis David Fernández- Verdejo
2023	University of Girona	External referee and jury member for the PhD thesis defence of the candidate Miguel Osset Álvarez

### Part V - a Society memberships, Awards and Honors

Year	Title
2015	Membre of the International Society Microbial Electro technology (ISMET)
2021	Member of the “Italian Association of Chemical Engineering” (AIDIC) Working group on “Renewable Energies and distributed production”
2012	Best Master Degree Award Remtech EXPO, Ferrara, Italy
2015	Best oral presentation (3 <sup>rd</sup> place) 6 <sup>th</sup> European Bioremediation Conference Chania, Greece
2016	Best oral presentation, VII Young Chemists Conference “Le frontiere della Chimica nel nuovo millennio” Roma, Italy
2017	Best oral presentation “IX Oil and Gas Horizon” Moscow, Russian Federation
2022	National Scientific qualification as associate professor in the Italian higher education system, in the call 2021/2023 (Ministerial Decree n. 553/2021 and 589/2021) for the disciplinary field of 09/D3 – Chemical plants and technologies. (Academic Recruitment Field 09/D - Chemical and materials engineering, according to the national classification).
2023	Winner of the public selection (1 <sup>st</sup> position – A8 category) for researchers’ recruitment in the ENEA (National Agency for Alternative Energies) – Public call ENEA RIF. RIC01/2020 – Decree number 77/2023/DIRGEN
2023	Winner of the national selection (1 <sup>st</sup> position – regione Marche) for the recruitment of high school teachers in “Chemical Science and Technology (A034) – Public call DD 499/2020 – Decree 0000657 19 July 2023
2023	Sapienza University soft Skills training course for young researcher, University of Rome Sapienza 20 November – 15 December 2023

### Part V - b – Editorial activity

Year	Role	Title	Journal	Editor	IF-Quartile
2021	Guest editor	Special issue “Bioengineering in Remediation of Polluted Environments”	Bioengineering	MDPI	4.6 – Q2
2022	Topical Advisory Panel	Member of the of the Topical Advisory Panel "Bioengineering" journal	Bioengineering	MDPI	4.6 – Q2
2022	Editorial	Member of the Editorial Board of	Molecules	MDPI	4.6 – Q2

	board member	"Molecules" journal – section Electrochemistry			
2012	Editorial board member	Member of the Editorial Board of the "BMC Biotechnology" journal	BMC Biotechnology	Springer Nature	3.5 -Q2
2016	Guest editor	Special issue “Electrified Biotechnologies: Recent Environmental Applications of Microbial Electrolysis Cells”	Bioengineering	MDPI	4.6 – Q2

## Part VI - Funding Information [grants as PI-principal investigator or I-investigator]

Year	Role	Title	Program	Grant value (€)
2014-2015	PI	Development of a bioelectrochemically assisted electro dialysis process for the post-treatment of liquid and gaseous effluents from anaerobic digestion	Internal projects University of Rome Sapienza	
2017-2018	PI	Development of a bioelectrosynthesis process for the fixation of CO <sub>2</sub> in organic compounds	Internal projects University of Rome Sapienza	
2018-2019	PI	Carbon dioxide capture and nutrient recovery by bioelectrochemical process	Internal projects University of Rome Sapienza	
2021-2022	PI	Stimulation of the reductive dechlorination of Trichlorethylene using different electron donors	Internal projects University of Rome Sapienza	
2019-2022	I	ELECTRA project - Electricity driven Low Energy and Chemical input Technology for Accelerated bioremediation (GA number 826244)	Horizon 2020	
2022	I	Bioenergy and Green Chemistry Research line 2 - FP1- Rome Technopole - Decarbonization and digitalization in research on new green energy sources	PNRR Missione 4 Componente 2	
2022	I	Innovative biological and bio-electrochemical processes for the production of hydrogen from waste organic matrices	Call Bric 2022, Piano attività di ricerca 2022/2024 (ID64)	

## Part VII a – Research Activities

### Keywords

Bioelectrochemical processes
Biogas upgrading
Bioremediation
Green Hydrogen
CO <sub>2</sub> conversion

### Brief Description

My research activities have been focused on the development of innovative biological approaches for wastewater and groundwater treatment known as bioelectrochemical systems. The bioelectrochemical systems allow to stimulation of the microorganism's metabolism through the application of a fixed potential or current by using devices named microbial electrolysis cells. The wastewater valorization through microbial electrolysis cells was investigated by combining the oxidation of the organic matter contained in synthetic and real wastewater and the generation of reduced compounds like hydrogen, methane or acetic acid. Different reactors' geometric and sizes have been explored with the main aim of maximizing wastewater oxidation, biofuel production and nutrient recovery. More recently the bioelectrochemical approach has been adopted in the bioremediation of

contaminated groundwater treatment. Indeed, an innovative membrane-less bioelectrochemical reactor configuration was realized and validated for the stimulation of reductive and oxidative dechlorination pathways to remove chlorinated aliphatic hydrocarbons from groundwaters. The technology's validation has also been conducted in a pilot environment, realizing a 400 L installation for the treatment of real contaminated groundwater. In the last period, my research interests moved towards utilizing COMSOL Multiphysics simulation software for electrochemical and bioelectrochemical process representation. A consistent part of my research activity has been conducted in the frame of international collaborative research projects with several research groups and companies. The major part of my scientific outputs regarded the dissemination of the result to the scientific community through scientific articles publication and participation in scientific conferences, moreover, in the last period patent deposits have been also conducted for future technology development.

### Part VII - b – Participation in research groups

Year	Role	Project Title	Program
2012-2014	Research member unit	Routes project - Innovative system solutions for municipal sludge treatment and management (Contract No 265156, FP7 2007-2013, THEME [ENV.2010.3.1.1-2])	FP7 programme
2014-2017	Research member unit	Project WISE - Turning organic Waste into Innovative and Sustainable End-products (Protocollo 2012PE7JEE_001)	PRIN 2012 -
2016-2020	Research member unit	WE-MET project - Sustainable wastewater treatment coupled to energy recovery with microbial electrochemical technologies (ERANET_NEXUS-14-035)	ERANET MED
2016-2021	Research member unit	NO-AW project - No Agro-Waste: Innovative approaches to turn agricultural waste into ecological and economic assets (GA number 688338)	HORIZON 2020
2019-2022	Coordinator of the research unit	ELECTRA project: Electricity driven Low Energy and Chemical input Technology for Accelerated bioremediation (GA number 826244)	HORIZON 2020
2022	Coordinator of the research unit	Bioenergy and Green Chemistry Research line 2 - FP1-Rome Technopole - Decarbonization and digitalization in research on new green energy sources	PNRR Missione 4 Componente 2
2022	Coordinator of the research unit	Innovative biological and bio-electrochemical processes for the production of hydrogen from waste organic matrices	Call Bric 2022, Piano di attività di Ricerca 2022/2024, (ID64)

### Part VIII – Summary of Scientific Achievements

Product type	Number	Data Base	Start	End
Papers [international]	43	Scopus	2013	2024
Conference Participation (main author)	33	Self certified	2013	2024
Patents [national]	2	Deposit 10202300000999 of 24.01.2023	2023	2024
		Deposit 102023000020616 of 05.10.2023		
Book chapters [scientific]	2	<a href="https://doi.org/10.1002/9783527343829.ch5">https://doi.org/10.1002/9783527343829.ch5</a>	2016	2024
		<a href="https://doi.org/10.1007/698_2023_1065">https://doi.org/10.1007/698_2023_1065</a>		

Total Impact factor	207
Total Citations	744
Average Citations per Product	17.3
Hirsch (H) index	15
Normalized H index*	1.36

\*H index divided by the academic seniority (11 years from first publication).

### Part IX– Selected Publications

	Year	Journal	Authors	Title	IF	Quartile	Citations
1	2017	Chemical Engineering Journal	Zeppilli M., Gottardo M., Micolucci F., Villano M, Majone M.	Using effluents from two-phase anaerobic digestion to feed a methane-producing microbial electrolysis	6.735	Q1	23
2	2017	Fuel Cells	Zeppilli M, Mattia A., Villano M, Majone M	Three-chamber Bioelectrochemical System for Biogas Upgrading and Nutrient Recovery	1.706	Q2	30
3	2019	Chemical Engineering Journal	Zeppilli, M., Simoni, M., Paiano, P., Majone, M.	Two-side cathode microbial electrolysis cell for nutrients recovery and biogas upgrading	10.652	Q1	38
4	2019	Biochemical Engineering Journal	M. Zeppilli, P. Paiano, M. Villano, M. Majone	Anodic vs cathodic potentiostatic control of a methane producing microbial electrolysis cell aimed at biogas upgrading	3.475	Q2	29
5	2020	Chemical Engineering Journal	M. Zeppilli, H. Chouchane, L. Scardigno, M. Mahjoubi, M. Gacitua, R. Askri, A. Cherif, M. Majone	Bioelectrochemical vs hydrogenophilic approach for CO <sub>2</sub> reduction into methane and acetate	13.273	Q1	27
6	2020	Renewable Energy	M. Zeppilli, L. Cristiani, E. Dell'Armi, M. Majone	Bioelectromethanogenesis reaction in a tubular Microbial Electrolysis Cell (MEC) for biogas upgrading	8.001	Q1	39
7	2021	Chemical Engineering Journal	Zeppilli, M., Paiano, P., Torres, C., Pant D.	A critical evaluation of the pH split and associated effects in bioelectrochemical processes	16.744	Q1	41
8	2021	Journal of Environmental Chemical Engineering	Zeppilli, M., Maturro, B., Dell'Armi, E., Cristiani, L., Petrangeli Papini, M., Rossetti, S., Majone, M.	Reductive/oxidative sequential bioelectrochemical process for Perchloroethylene (PCE) removal: effect of the applied reductive potential and microbial community characterization	7.968	Q1	23
9	2021	Biochemical Engineering Journal	Zeppilli, M., Cristiani, L. Dell'Armi, E., Villano M.	Potentiostatic vs galvanostatic operation of a Microbial Electrolysis Cell for ammonium recovery and biogas upgrading	4.446	Q2	10
10	2022	Journal of Water Process Engineering	Dell'Armi, E., Zeppilli, M., Di Franca, M. L. Maturro, B.M. Rossetti, S., Petrangeli Papini, M. Majone	Evaluation of a bioelectrochemical reductive/oxidative sequential process for chlorinated aliphatic hydrocarbons (CAHs) removal from a real contaminated groundwater	7	Q1	8
11	2023	Renewable	Cristiani, L., Leobello,	Role of C/N ratio in a pilot scale	8.7	Q1	1

	Energy	L., Zeppilli, M., Villano, M.	Microbial Electrolysis Cell (MEC) for biomethane production and biogas upgrading				
12	2024	Environmental science and Ecotechnology	Zeppilli, M., Yaqoubi, H., Dell'Armi, E., Lai, A., Belfaquir, M., Lorini, L., Petrangeli Papini, M.	Tetrachloroethane (TeCA) removal through sequential graphite-mixed metal oxide electrodes in a bioelectrochemical reactor	12.6	Q1	1

Rome 07 February 2024

Marco Zeppilli