Gabriele Centi

CURRICULUM VITAE (AUG. 25)

PERSONAL INFO **Gabriele CENTI**

Office: Dip. ChiBioFarAm, Univ. degli Studi di Messina,
v.le F. Stagno D'Alcontres 31, 98166 Messina, Italia
+39 090 676 6506 +39 392 1992182

centi@unime.it

catalysis.unime.it

Sex M | Date of birth 18/10/1955 | Nationality Italian

ACTUAL POSITION Full Professor in Industrial Chemistry (CHIM / 04) at the University of Messina

DEGREE Degree in Industrial Chemistry (obtained in 1979 at the University of Bologna)

SHORT SUMMARY

Gabriele Centi is a Full Professor of Industrial Chemistry at the University of Messina, Italy, and President of the European Research Institute of Catalysis (ERIC). The research interests encompass the fields of applied heterogeneous catalysis, sustainable energy and chemical processes, hydrogen production and use, biomass conversion, and environmental protection. Recent activities focus on the development of catalytic technologies for solar fuels, carbon circularity, and the electrification of chemical production.

He was the coordinator of the EU Network of Excellence IDECAT and is the past President of IACS (International Association of Catalysis Societies). Previously, he served as the President of EFCATS (European Federation of Catalysis Societies). He has served as the coordinator or PI in over 30 EU projects. He recently initiated and coordinated an ERC Synergy project on plasma catalysis. He is also a member of the board of SUNERGY, the European initiative on solar fuels, and SUNER-C, the EU coordination and support actions to prepare a partnership on substituting fossil fuels.

He has received numerous awards, including i) the International Fellowship Initiative of the President of the Chinese Academy of Sciences, PIFI, as a Distinguished Scientist, ii) the Humboldt Research Award, iii) the Chini Memorial Lecture and the Gold Medal S. Cannizzaro of the Italian Chemical Society and recently iv) the EFCATS & APCATS Michel Che Award. He is involved in various publishing activities. He chaired the editorial board of *ChemSusChem* until 2019 and is co-editor-in-chief of the *Journal of Energy Chemistry*, which has been elevated to a high-IF journal, and the *Studies in Surface Science and Catalysis* series of books, one of the oldest and best-known in catalysis. He has been chairperson of numerous international conferences, including Europacat 2017 in Florence and the 16th International Zeolite Conference, jointly with the 7th International Mesostructured Materials Symposium (Sorrento, Italy, 2010). He has been extensively plenary and keynote lectures worldwide.

He is the author of over 650 scientific publications (Iris Cineca) and 17 books (2 in prints), and he serves as the editor of more than 25 special issues of internationally recognised journals. The current h-index is 103, with >43,000 citations and >450 articles that have received more than 10 citations (Google Scholar, Aug 2025). In the 2024 ranking by Stanford University of the top 2% of worldwide scientists, he was among the top 5,000 researchers worldwide in all scientific areas and among the first in Sicily.

.

EDUCATION AND CAREER

1979	Degree in Industrial Chemistry at the University of Bologna (prof. F. Trifirò)
1981	Fellowship, Experimental Fuel Station (Milan)
1983-1987	Researcher (Industrial Chemistry), Univ. Bologna
1987-1995	Associate Professor in Chemical Plants (ING-IND / 25), Univ. Of Bologna
1996-today	Full Professor (Industrial Chemistry), Univ. Messina
2008- today	President of the European Research Institute of Catalysis (ERIC aisbl, Brussels - Belgium)
2019- 2023	Delegate of the Rector of the Univ. Messina for the Green Deal
2020- today	PhD Coordinator (International, Industrial) ACCESS "Advanced Catalytic proCesses for using renewable Energy SourceS", Univ. Messina

RESEARCH & QUALIFICATION

CAREER AND ASSIGNMENTS

2025	EFCATS & APCATS Michel Che Award, for the groundbreaking work in CO_2 conversion, electrocatalysis, and solar fuels
2025	ERC PoC on solar H_2
2024	World's Top 2% Scientists ranking (Stanford University). In the top 5.000 researchers' rankings to last year (2023) and in the first 10.000 for the career, the first among those of the University of Messina.
2023	*Italian Knowledge Leader* award for the international research activity and promotion of the international knowledge network.
2022	Among the 34 scientists invited by CEFIC (European federation of chemical industries) to celebrate the 50th Years of the Society on May 29, 2022.
2021	Recognition as a Distinguished Scientist by the International Fellowship Initiative (PIFI) of the President of the Chinese Academy of Sciences,
2021	Humboldt Research Award
2019-today	Member of the hydrogen working group of the MUR for the preparation of an Italian hydrogen research strategy (SIRI)
2018-today	Member of the Academy of Sciences Institute of Bologna, Section - Mathematics, Physics, Chemistry and Geology
2017-today	Honorary Professor of Tianjin University (TJU), China
2016-2024	President of IACS (International Association of Catalysis Societies) (from 2012 to 2016, vice president of IACS)
2015-today	Chemistry Europe Fellow
2008-today	President of the European Research Institute on Catalysis, coordinating the activities of 24 European institutions on catalysis.
2001-2005	President of the European Federation of Catalysis Societies (EFCATS)
2015-2019	Scientific Advisor of the EU Cluster of Catalysis
2018	Member of the writing team of SAPEA (Science Advice for Policy by European Academies) Evidence Review Report for the European Commission "Novel carbon capture and usage technologies: Research and climate issues"
2016	Coordination of preparing the "Science and Technology Roadmap on Catalysis for Europe. A Path to Create A Sustainable Future" ISBN 979-12-200-1453-3
2001-2009	co-Director of the European Laboratory of Surface Science and Catalysis (ELCASS) created in 2001 by CNRS and University of Strasbourg (France), MPG and Fritz-Haber Institute of Berlin (Germany) and University of Messina (Italy)).
2015-2017	Vice President of the European Federation of Catalysis Societies (EFCATS)
2016-2019	Vice-President of the Interuniversity Consortium INSTM (Science and Technology of Materials), Italy (since 2013, also a member of the INSTM Executive Board)
2009-2012	Director of Thematic Section 2 - Energy and Environment - of INSTM
2008-2016	Director of the INSTM CASPE center (Catalysis for Sustainable Production and Energy)
2006-2012	Scientific Director of the Italian Sustainable Chemistry Platform
2007-2010	Member of the Mirror Group of the European Technological Platform on Sustainable Chemistry (ETP SusChem)
2005-2012	Member of several international panels and boards: CSIC (Spain), ICSC (Krakov, Poland), U.S. DoE, ACENET ERA-NET, ERA-NET CAPITA, ANR (France), Academy of

		Finland, etc.
	2013	Member of the GEV panel (Area 3 - Chemical Sciences) for VQR 2004-2010
	2015	Member of the GEV panel (Area 3 - Chemical Sciences) for VQR 2011-2014
	2004-2010	Member of the Council of the International Zeolite Association (IZA)
	2001-2005	Member of the Council of the Catalysis Group of the Italian Chem. Society (SCI)
	2016-2021	Member of the Board of the Division of Industrial Chemistry of SCI
EDITORIAL ACTIVITIES	2015-today	Editor-in-chief *Journal of Energy Chemistry* (Elsevier)
	2003-today	Editor in chief of the *Studies in Surface Science and Catalysis* series of books published by Elsevier Science (Amsterdam) (178 Vol. Published in the series)
	2020-2023	ChemSusChem Board Member
	2007-2019	Chairman of the editorial board of Wiley-VCH magazine *ChemSusChem* (Chemistry & Sustainability, Energy & Materials)
	2011-2018	Editor of the series of books *Green Energy* published by De Gruyter (Berlin)
	2012-2016	Member of the Advisory Board of Wiley *Energy Technology* journal,
	2012-today	Member of the Advisory Editors Board of the Elsevier *Journal of CO_2 Utilization* and *Chinese Journal of Catalysis*
	2016-today	Member of the editorial board of Wiley-VCH Batteries & Supercaps and Journal of the Chinese Chemical Society
	2020-today	Member of the editorial board of the *Journal of Catalysis*
	2009-2017	Member of the Scientific Committee of the journal Wiley *ChemCatChem*
	2003-2018	Member of the Scientific Committee of the magazine *"La Chimica e l'Industria"*
	1992-1996	Member of the Editorial Committee of the Applied Catalysis journal.
	1996-2004	Member of the Editorial Committee of *Appl. Catal. B. Env.*
EU ACTIVITIES *selection*	2025	ERC PoC grant on solar H_2
	2020-today	Coordinator of the EU DECADE project "DistributEd Chemicals And fuels production from CO_2 in photoelectrocatalytic DEvices"
	2019-today	ERC Synergy SCOPE Coordinator "Rapid Surface Modulation Plasma for Process Intensification and Energy Intensification in Small Molecule Conversion"
	2020- today	Board Member of the SUNERGY Initiative on Solar Fuels and Chemicals for a Circular Economy, to prepare for an EU partnership
	2022-2025	Board Member of the EU CSA SUNER-C "Community and eco-system for accelerating the development of solar fuels and chemicals"
	2019-2020	Member of the board of EU-CSA ENERGY-X "Transformative chemistry for a Sustainable Energy Future" to prepare a flagship on fuels and chemical products made with renewable energy
	2015-2019	Coordinator of the EU TERRA project "New adaptable catalytic reactor methodologies for Process Intensification"
	2015- today	PI in various EU H2020 projects (BIZEOLCAT, OCEAN, PERFORM, RECODE) and EU FP7 projects (HELMETH, Eco$_2$CO$_2$) and H2020 projects (EPOCH, Greenswap, Eretech) on topics of catalysis, electrocatalysis and electrification of reactors
	2013-2016	IAPP Project (Marie Curie Industry-Academia Partnerships and Pathways) BIOFUR "BIOpolymers and BIOfuels from FURan based building blocks"
	2005-2010	Coordinator of the Network of Excellence IDECAT (Integrated Design of Catalytic Nanomaterials for Sustainable Production) - EU (5 years, € 9.5 M, April 2005)
	2009-2014	Coordinator of the collaborative project EU NEXT-GTL (budget about 12.5 M €)
	2012-2015	Coordinator of the CSA eCAMM (European Structured Research Area for CAtalytic and Magnetic nanoMaterials), contract 290455
	2002-2005	Coordinator of the EU project NEOPS G5RD-CT2002-00678 New eco-efficient oxidation processes based on the synthesis of H2O2 on catalytic membranes
	2002-2005	Coordinator of the EU project NANOSTRAP G3RD-CT2002-00793 "Nanostructured Sulfur Traps for the protection of high-performance NOx storage / reduction catalysts"
	1996-today	Scientific Responsible of Messina (Univ. Or UdR INSTM / ERIC) in various community projects on the development of sustainable industrial processes and technologies for energy and environmental protection: NATAMA, CONCORDE, SMART, SUPER, COCON, STORECAT, DENITROCAT, H2O-RECYCAT, NEMCA, ALKYL, WAVES (ERA-NET CAPITA)

NATIONAL PROJECTS (selection)

2011-2018	PI of Univ. Messina in the projects PON01_01725 (Photovoltaic) and PON02_00355_3391233 (Energy) [MIUR]
2014-2015	Project responsible "Development of a membrane reactor heated by molten salts for the dehydrogenation of propane" (MEME) [MAE]
2014-2016	PI of UniME in the project "Innovative processes for the conversion of algal biomass", project "PRIN10 / 11, 2010H7PXLC_006 [MIUR]
2016-2018	UNIME responsible for the "Solar driven chemistry: new materials for photo- and electrocatalysis" project PRIN2015 / 2015K7FZLH_004 [MIUR]
2019-today	National coordinator of the PRIN2017 project "Multielectronic transfer for the conversion of small molecules: an enabling technology for the chemical use of renewable energies (MULTI-e)" project 20179337R7
2022-today	Coordinator of the project MECCA (MITE research on H_2) "Green H_2 from bioMethane cracking through an innovative technology based on non-thermal plasma and catalysis with nanoCArbones"
2022-today	PI of the project MIAMI (MISE, Research of system on green electricity) "Innovative Materials for Hybrid Storage Systems"
2024-today	PI in the AmMoniA as a ZEro-carbon fuel and H2 carrier (AMAZE) project, CETPartnership Joint Call 2023 (CETP-2023-00120)

COLLABORATIONS WITH COMPANIES

2000-today	Various bi- and multilateral cooperation between academia and industry, with industrial partners such as ENI, ERG, Bayer, BASF, ACTA, TOYOTA, etc.

PUBLICATIONS

Updated publication list available on:
https://scholar.google.com/citations?user=FlqkRbYAAAAJ&hl=it

Selection of five recent publications on collaboration with Asian researchers:

1. Generation of oxide surface patches promoting H-spillover in Ru/(TiOx)MnO catalysts enables CO_2 reduction to CO, H Kang, L Zhu, S Li, S Yu, Y Niu, B Zhang, W Chu, X Liu, S Perathoner, G Centi, Y Liu, *Nature Catalysis* **2023**, 1-11. (*IF: 40,7*)
2. Understanding the complexity in bridging thermal and electrocatalytic methanation of CO_2, H Kang, J Ma, S Perathoner, W Chu, G Centi, Y Liu, *Chem Soc Rev* **2023**, 52, 3627-3662. (*IF: 46,2*)
3. Develop High-Performance Cu-Based RWGS Catalysts by Controlling Oxide–Oxide Interface, S Li, X Liu, J Ma, F Xu, Y Lyu, S Perathoner, G Centi, Y Liu, *ACS Catalysis* **2025**, 15, 3475-3486. (*IF: 13,1*)
4. High-dispersed CeOx species on mesopores silica to accelerate Ni-catalysed CO_2 methanation at low temperatures, J Ma, Q Jiang, S Li, W Chu, H Qian, S Perathoner, G Centi, Y Liu, *Chemical Engineering Journal* **2024**, 479, 147453. (*IF: 13.4*)
5. Oxygen vacancy-dependent chemical intermediates on Ru/MnO catalysts dictate the selectivity of CO2 reduction, H Kang, L Ma, S Li, X Chen, W Chu, R Zhang, S Perathoner, G Centi, Y Liu, *Applied Catalysis B: Environment and Energy* **2024**, 352, 124010. (*IF: 20.3*)

QUALIFICATION

- In first place in Sicily among the top 2% of researchers, based on the Stanford University-Elsevier study (2022).
- *Top Italian Scientists*: first researcher of industrial chemistry and among the top 10 chemistry researchers operating in Italy (h-index)

BIBLIOMETRIC DATA

- h-index 103 (Google Scholar, Aug 25) with 43159 citations and i10-index of 456.

  Scival (Scopus): 2024: 9.1% and 68.2% in 1% and 10% top most viewed; Field-Weighted Views Impact 3.0; 6.7% and 26,7% in 1% and 10% most cited publications (2024); 2021-24 80.9% in top quartile (68 publications in total); 38 (55.9%) number of publications in the top 10% journals.

Recent plenary, keynote and invited lectures (**limited to recent years**)

2025

- G. Centi, Heterogeneous catalysis for green chemistry, Scientific Symposium connected to the GCS4CE Winter School, 21 Feb. 2025, Padova - Italy, plenary
- G. Centi, ELECTROCATALYSIS, Prospects and role to enable an e-chemistry future, Clkuster meeting 2025, June 22-27, 2025, Prague (Czech Rep.), invited.
- G. Centi, Catalysis for circular energy transition, Scientific Symp. and School on Circular Economy For The Energy Transition, Padova, 30th June - 04th July 2025, plenary
- G. Centi, Solar-to-X technologies; Their essential role in a resilient and low-carbon future. IUPAC 2025 and 50th Wolrd Chemistry Congress, 14-19 July 2025, Kuala Lumpur - Malaysia, keynote
- G. Centi, Transformative catalysis for a resilient and low-carbon future, Europacat 2025, Trondheim (Norwey) Aug. 30 - Sept 5, 2025, keynote

2024

- G. Centi, Expanding the catalysis concepts to address the challenge of solar fuels and electrification of the chemical production, DICP - Dalian (China), 16th Jan. 2024, plenary
- G. Centi, H_2, solar fuels and PEC devices for a solar-based and circular-carbon economy, University of Science and Technology of China (USTC), Hefei - China, 22th Jan. 2024, plenary
- G. Centi, An unorthodox viewpoint on the new frontiers to bridge heterogeneous to reactive (photo-, electro- and plasma) catalysis design, International Workshop Multiscale Computational Design of Heterogeneous Catalysts, 14-15 Feb. 2024, Napoli, plenary
- G. Centi, Why pass from Power-to-X to Solar-to-X for a disruptive approach revolutionising industrial production, Virtual meeting for industrial members of the Catalytic Advances Program (CAP), Catalysis Group TCGR (US), online, April 24th 2024 - online, invited
- G. Centi, The Chemical Industry Perspective, The future of the chemical and refining sectors: needs and opportunities for decarbonisation May 16th 2024, Confindustria Siracusa/The European House Ambrosetti, invited
- G. Centi, Addressing complexity in bridging heterogeneous and photo/electro catalysis. Why new concepts and approaches are required, Complexity at catalytically relevant interfaces (Irsee X Symposium), 6-9 June 2024, KlosterIrsee, Germany, invited
- G. Centi, Carbon-Based Catalysts for e-Chemistry Transition, CARBOCAT 10 – Florence, June 24-26, 2024, keynote
- G. Centi, Selective (Industrial) Oxidation. Quo Vadis?, ADHOC 2024, 30th June - 4th July 2024, Venice (Italy), keynote
- G. Centi, DECADE project: Synthesize the same product at both cathodic and anodic sides of photoelectrochemical cells, 4th CO2OLING The Earth Summer School (Innovative hybrid technologies for CO2 conversion into added-value commercial products), 9-10th July 2024 (ONLINE), invited
- G. Centi, Solar fuels for carbon circularity and closing the cycle, Catalysis in a Changing Environment – Linking Fundamental Aspects to Engineering, 21-23 July 2024, TUM - Munich, Germany, invited
- G. Centi, Reinventing chemical industry for a sustainable future, Green Chemistry workshop, Mantova, De. 17th, 2024
- G. Centi, Roundtable on reserach and development of e-fuels, Workshop on Synthetic fuels (e-Fuels), Accademia Nazionale Dei Lincei - Rome (Italy), 3-4 Oct. 2024, invited

2023

- G. Centi, An intro to ERC Synergy SCOPE Project, Australian national workshop of plasma and catalysis researchers, April 26, 2023, Adelaide (Australia), invited /online)
- G. Centi, Foster innovation in the production and distribution of green H2 ,14th European Congress of Chemical Engineering and 7th European Congress of Applied Biotechnology, 17-21 Sept. 2023, Berlin (Germany), invited
- G. Centi, SUNER-C: foster activities between projects in the area of solar fuels, Brussels. 10th Oct. 2023, keynote
- G. Centi, From e-fuels to solar fuels to address the challenge of a carbon-neutral future, 4th EECAT (The 4th Int. Symp. on Catalytic Science and Techn. in Sustainable Energy and Environment), 15-18th Oct. 2023, Beijing, China, plenary
- G. Centi, DECADE project: CO2 to acetyl acetate, Webinar SUN2CHEM "European strategies and perspectives for converting solar energy into fuels", October 24th, 2023, keynote
- G. Centi, Green Hydrogen peroxide, Workshop "Catalysis: yesterday, today and tomorrow", Venice, 8th Nov. 2023, invited
- G. Centi, The role of (photo)electrocatalytic devices for a solar-based and circular-carbon economy, IC-MES2023 ALGERIA, 12-14 November 2023, plenary

2022

- G. Centi, Outlook for CO_2-Reduction and Future Scenarios on a European Level, Wilhelm e Else Heraeus 758 Seminar (From Wind and Solar Energy to Chemical Energy Storage: Understanding and Engineering Catalysis

under Dynamic Conditions), 10th-13rd Jan. 2022, online, plenary

- G. Centi, Chemistry and catalysis technologies for sustainable development and renewable energy, On-line School of SSCC (national Doctorate on Sustainability and Climate Changes), January 20 2022
- G. Centi, La CO2 come risorsa, Convegno della Regione Lombardia "Il futuro ispirato alla natura: strategie, materiali, processi e orizzonte della transizione sostenibile", 18 Marzo 2022, Milano, plenary
- G. Centi, DistributEd Chemicals And fuels production from CO2 in photoelectrocatalytic Devices, CEN/TC 386 "Photocatalysis" plenary meeting 21-22 March 2022, online, keynote
- G. Centi, Electrodes synthesis and properties, eCCU3 March 30 2022, online, invited.
- G. Centi Solar to chemical energy storage: a crucial technology for islands, SOLAR2CHEM X SEAFUEL Symposium, March 30 - April 1 2022, Tenerife, Canary Island (Spain), plenary
- G. Centi, Opportunities for catalytic technologies in an evolving scenario, CASALE Co., Lugano, April 8 2022, invited.
- G. Centi, Expanding the concepts to address the challenge of solar fuels and electrification of the chemical production, Symp. on Materials for emerging energy technologies, IMDEA Energy Institute, May 19th-20th, 2022, plenary
- G. Centi, From thermal to reactive catalysis to move beyond fossil fuels, 19th Nordic Symposium on Catalysis, Espoo (Finland), 6-8th June 2022, plenary
- G. Centi, e-Refineries for solar conversion into chemicals: challenges and opportunities, SUNER-C Roadmap meeting Shaping the future: renewable fuels & chemicals from solar energy, Bruxelles, 14-15 June 2022, keynote
- G. Centi, Catalysis for the net zero emission challenge, 12th International Conference on Environmental Catalysis (ICEC2022), July 30-August 2, 2022, Osaka, Japan, keynote
- G Centi, Expanding the concepts to address the challenge of solar fuels and electrification of the chemical production, Expanding the concepts to address the challenge of solar fuels and electrification of the chemical production, August 9 2022 (online), plenary
- G. Centi, Plasma-catalysis to address CO_2 utilisation challenge in energy-intensive industries, International Symposium on Plasma Catalysis For CO_2 Recycling, 13th-15th September 2022, Krakow, Poland, plenary
- G. Centi, Plasmonic catalysts at room temperature, 2nd Int Conf. on Unconventional Catal., Reactors and Appl. Sept. 21-23th, 2022 Leamington Spa, U.K., keynote.
-

2021

- G. Centi, Close the carbon cycle through substitution of fossil fuels, STOA (European Parliament) workshop "Decarbonising European Industry: Hydrogen and Other Solutions", March 1, 2021, online, invited
- G. Centi, Opportunities and needs for catalysis to close the carbon cycle and go beyond the use of fossil fuels, RIPP, SINOPEC (Beijing, PR China) March 3, 2021, Online, plenary
- G. Centi, How a strong EU community accelerates electrocatalyst research, Electrocatalysis Summit, April 14, 2021, online, keynote
- G. Centi, Photoelectrocatalysis for the conversion of CO_2 avoiding water oxidation, SUNCOCHEM Webinar, April 28, 2021, online, keynote
- G. Centi, The vision of future sustainable energy & production: opportunities for innovation & business, MSc in Business Administration Univ. Rome "Tor Vergata", May 12, 2021, online, plenary
- G. Centi, Advanced Photoelectrocatalytic Devices for Coupling Bio- and Solar-Refinery, EU Green Week, 4th June 2021, online, keynote
- G. Centi, Bio-based feedstocks to chemical building blocks: design and technical feasibility, Organic electrochemistry: towards a sustainable chemical industry in 2030, June 10, 2021, online, keynote
- G. Centi, Ripensare la produzione chimica per affrontare la sfida dei cambiamenti climatici e della sostenibilità, AIDIC - giornata sulla transizione energetica e ambientale, 23 giugno 2021, keynote
- G. Centi, La filiera dell'idrogeno, Stati Generali Idrogeno, Catania 15 Luglio 2021
- G. Centi, Electrocatalysis: role and prospects to defossilize chemical and energy, plenary production, 1st Malaysia inter-conference on nanotechnology & catalysis MICNC2021 – September 1 2021, online
- G. Centi, Rethinking e-catalysis to address defossilization of chemical and energy production, Young Researchers CIS 202, September 8 2021, online, plenary
- G. Centi, Electrocatalysis: role and prospects to defossilize chemical and energy production, Fundacion Ramon Areces, October 5, 2021, online, plenary
- G. Centi, Electrocatalytic direct nitrogen fixation: perspectives and gaps, Solvay Workshop on "Plasma Technology and Other Green Methods for Nitrogen Fixation", (Brussels, November 15-17, 2021), keynote
- G. Centi, Electrocatalysis: role and prospects to defossilize chemical and energy production, XVth International Symposium on Environment, Catalysis and Process Eng. ECGP'15, 23 - 25 November 2021, online, plenary
- G. Centi, Rethinking e-catalysis to address defossilization of chemical and energy production, Casale-Symposium «Catalysis for the Industrial Renaissance and New Sustainable Processes» November 16, 2021 - online, plenary

- G. Centi, Moderator of Public Session: European Hydrogen Research and Innovation Priorities, Session 2 (Renewable Hydrogen Production, Distribution and Storage), November 30 2021 (Brussels, Belgium).

Awards and recognitions

2009 Soc. Chim. de France French-Italian. Award for outstanding works in industrial chemistry. and sustainable processes
2010 UOP 2010 Lectureship
2010 Finalist of the European Sustainable Chemistry Award 2010 (EuCheMS)
2013 MPG 2013 Award "Frontiers in Chemical Energy Science" (Mühlheim an der Ruhr, Germany)
2014 LEE HSUN Lecture Series 2014 Award, Inst. by Metal Res., Chinese Acad. Science, Shenyang (China)
2015 Catalysis Forum Lectureship (State Key Lab. Of Catalysis, Dalian - China)
2015 Kekule Lecture (Univ. Antwerpen)
2015 Fellowship award of the European Chemical Societies - ChemPubSoc Europe (F CPSE)
2016 Speaker at C5MPT Summit, Univ. Of Alberta (Edmonton, Canada)
2016 Chini Memorial Lecture (Italian Chemical Society)
2017 Gold Medal S. Cannizzaro of the Italian Chemical Society.
2021 Recipient of the International Fellowship Initiative of the President of the Chinese Academy of Sciences (PIFI) as Distinguished Scientist
2021 Recipient of the Humboldt Research Award
2022 Among the 34 worldwide scientists invited by CEFIC (Eur. Fed. Chem. Industries) to celebrate the 50th Years of the Society.
2023 Italian Knowledge Leader award for science
2023-24 World's Top 2% Scientists ranking (Stanford University). In the top 5.000 researchers' rankings to last year (2023) and in the first 10.000 for the career, the first among those of the University of Messina
2025 ERC PoC grant on solar H2
2025 EFCATS & APCATS Michel Che Award, for the groundbreaking work in CO_2 conversion, electrocatalysis, and solar fuels

Visiting professor

2001 Università di Oulu (Finlandia)
2003 Université Louis Pasteur, Strasburgo (Francia)
2005 EPFL (Losanna, Svizzera)
2016 Univ. dell'Alberta (Edmonton, Canada), Relator to the Summit C5MPT
2016 Visiting professor (3 mesi) at Technische Univ. Munchen (Germany)
2015-17 Academic Icon (Univ. Malesia, Kuala Lumpur, Malesia)
2021-22 Visiting professor to CatLab Helmholtz-Zentrum Berlin (Germany)

Chairperson in conferences and international workshops (selection)

1995 1st World Conf. on Env. Catalysis (Pisa, May 1995),
1999 6th Eur. Workshop on Selective Oxidation (Rimini, Sept. 1999)
2000 NATO Adv. Res. Workshop on "Catalysis by unique metal ion structures in solid matrices" (Prague, July 2000),
2001 3rd Eur. Workshop on Environmental Catalysis (Maiori, May 2001),
2006 IDECAT-NRSC Conf. on Catalysis for Renewables (Rolduc, May 2006),
2007 Symp. Catalysis for Pollution Control and ISO2007 at Europacat VIII (Turku, Aug. 2007),
2010 IDECAT Conf. on Catalysis - Emerging challenges in catalysis (Porquerolles, May 2010),
2010 Innovation in catalysis for sustainable production & energy (Messina, Sept. 2010),
2010 Int. Zeolite and Mesoporous Materials conference (IZC16/IMMS7: Sorrento July 2010)
2011 X European Workshop on Selective Oxidation (ISO 2011; Glasgow, Sept. 2011),
2011 5th IDECAT/ERIC-JCAT Conference on Catalysis (Bertinoro, Sept. 2011)
2014 CIMTEC 2014 - Symposium Advances in Photocatalytic Materials for Energy and Environmental Sustainability, Montecatini 8-13, 2014
2015 CRS-3 Catalysis for Renewable Sources: Fuel, Energy, Chemicals (Catania, 6-11 Sept. 2015)
2016 CIMTEC 2016, Symposium "New Concepts and Advances in Photocatalytic Materials for Energy and Environmental Applications, Perugia (Italy), June 5-9, 2016
2017 Europacat 2017 (Florence, Italy), August 27-31, 2017
2019 CIS2019 Chemistry meets Industry and Society, Salerno (Italy), 28-30 August 2019
2020 CIMTEC 2020, Symposium "New Concepts and Advances in Photocatalytic Materials for Energy and Environmental Applications, Perugia (Italy), June 15-19, 2020 (suspended due to Covid-19)
2022 CIMTEC 2022, 9th Forum on New Materials, Symposium " Advanced Photocatalytic Materials for Energy and Chemistry in Transition and for the Environment", Perugia (Italy), June 27-29th, 2022

2025 13th ICEC International Conference on Environmental catalysis, Giardini Naxos/Taormina, 2-5 June 2025

2026 CIMTEC 2026 & 10th Forum on New Materials, Symposium FJ - Advanced Photo/Electro Catalytic Materials for a Low-Carbon and Resilient Transition, June 21-25, 2026, Perugia, Italy

Member of the Scientific Advisory Board of numerous international conferences (on average> 3-5 per year in the last years)

Reviewing activities

Selection

2015-today Editor-in-chief Journal of Energy Chemistry (Elsevier)

2003-today Editor in chief of the Studies in Surface Science and Catalysis series of books published by Elsevier Science (Amsterdam) (179 Vol. Published in the series)

2013-today Editor of 7 peer-reviewed books, and 8 species issues of journals

2007-2019 Chairman of the editorial board of Wiley-VCH magazine ChemSusChem (Chemistry & Sustainability, Energy & Materials)

2011-2018 Editor of the series of books Green Energy published by De Gruyter (Berlin)

2012-2016 Member of the Advisory Board of Wiley Energy Technology journal,

2012-today Member of the Advisory Editors Board or the Scientific Committee of various journals (Journal of CO_2 Utilization, Chinese Journal of Catalysis, Batteries & Supercaps, Journal of the Chinese Chemical Society, Journal of Catalysis, ChemCatChem, Applied Catalysis etc.)

Books (last ten years)

G. Centi, R.A. van Santen	*Catalysis for Renewables*	*Wiley VCH Pub.: Weinheim (Germany) 2007, pp. 448.*	*ISBN: 978-3-527-31788-2*
F. Cavani, G. Centi, S. Perathoner, F. Trifirò	*Sustainable Industrial Chemistry - Principles, Tools and Industrial Examples*	*Wiley VCH (Weinheim, Germany), 2009, pp. 621*	*ISBN: 978-3-527-31552-9*
G. Rios, N. Kanellopoulos, G. Centi	*Nanoporous Materials for Energy and the Environment*	*Pan Stanford Pub Pte (Singapore), 2012, pp. 305*	*ISBN: 978-9-814-26717-5*
M. De Falco, G. Iaquaniello, G. Centi	*CO_2: A Valuable Source of Carbon*	*Springer (Heidelberg, Germany), Series: Green Energy and Techn.2013, XVI, pp. 194*	*ISBN 978-1-4471-5119-7*
G. Centi, S. Perathoner	*Green Carbon Dioxide: Advances in CO_2 Utilisation*	*Wiley & Sons, New York (U.S.), 2014, pp 322*	*ISBN: 978-1-118-59088-1*
A.Basile, M. De Falco, G. Centi, G. Iaquaniello	*Membrane Reactor Engineering: Applications for a Green Process Industry*	*Wiley & Sons, New York (U.S.), 2016, pp 350*	*ISBN: 978-1118-90680-4*
A. Basile, G. Centi, M. De Falco, G.Iaquaniello	*Green Chemistry and Sustainable Energy. New Technologies for Novel Business Opportunities*	*Elsevier, Amsterdam (NL) 2020, pp. 576*	*ISBN:978-0-444-64337-7*
V.I. Parvulescu, B.M. Weckhuysen, G. Centi, S. Perathoner	*Unlocking the Future of Renewable Energy and Chemistry through Catalysis*	*Elsevier, Amsterdam (NL) 2025, in press*	*ISBN: 978-0443333316*
Volker Hessel Annemie Bogaerts Gabriele Centi Evgeny Rebrov Nguyen Van Duc Long	*Plasma-Assisted Nitrogen Fixation for Sustainable Process Industries*	*Wiley, (J. Wiley & Sons, US), 2025, in press.*	*ISBN: 978-1-394-28301*

RESEARCH ACTIVITY

Main sector: Heterogeneous catalysis and catalytic technologies, chemical processes with low environmental impact, development of nanomaterials for applications in the field of treatment and control of gaseous and liquid emissions, catalysis for sustainable processes and energy, development of electrocatalysts for fuel cells and electrochemical devices, nanostructured photocatalysts for water splitting, membranes for the separation of H_2, chemical energy storage (NH_3, formic acid), green H_2

Other fields: cleanup technologies (gas and liquid emissions), environmental catalysis, industrial

catalytic processes, solid catalysts (mixed oxides and zeolites, in particular containing transition metals, mesoporous materials, nanostructured oxides and carbon), reduction of greenhouse gases, use of solar energy, fuel cells and electrocatalytic (photo) devices

Systems based on nanotubes and nanostructures. Based on metal nanoclusters deposited on organised 1D-type carbon or metal oxide nanostructures for applications ranging from electrodes in PEM and PEC devices to photoactive thin films, sensors, advanced microreactors and catalysts for new energy and chemical processes.

Materials for solar fuels and renewable energy. Synthesis, characterisation and testing for applications ranging from advanced coatings and photoactive materials to novel catalysts and devices in sustainable chemical and energy processes (biomass conversion, renewable H_2, solar fuel from CO_2).

Catalytic membranes. Based on thin films supported by Pd alloy for applications from environmental protection (reduction of nitrates in water) to chemical synthesis (direct H_2O_2 synthesis) and energy. The recent focus is on new processes based on highly energy-efficient membranes for producing H2 by steam reforming CH4 and syngas by partial catalytic oxidation.

Chemo-catalytic processes for lignocellulosic biorefineries. Development of new catalysts for the conversion of lignocellulosic biomass (in particular waste materials) into new platform molecules (furfural) and catalytic upgrading of the latter to biofuels (petrol and diesel) or chemical products.

http://catalysis.unime.it

Gabriele Centi

PUBLICATIONS LAST 5 YEARS (2020 - AUG. 25)

2025

(1) Suliman, M. H.; Usman, M.; Al Naji, H.; Abdinejad, M.; Ullah, N.; Helal, A.; Abdelnaby, M. M.; Díaz-Sainz, G.; Centi, G. CO_2 electroreduction to C2 products on bimetallic silver copper melamine complexes. *Carbon Capture Science & Technology* **2025**, *14*, 100355.

(2) Li, S.; Liu, X.; Ma, J.; Xu, F.; Lyu, Y.; Perathoner, S.; Centi, G.; Liu, Y. Develop High-Performance Cu-Based RWGS Catalysts by Controlling Oxide–Oxide Interface. *ACS Catalysis* **2025**, *15*, 3475-3486.

(3) Centi, G.; Perathoner, S. Electrocatalysis: Prospects and Role to Enable an E-Chemistry Future. *The Chemical Record* **2025**, e202400259.

(4) Centi, G.; Perathoner, S. Addressing the Complexity of Bridging Thermal and Reactive Catalysis. The Role of Strong Localised Electrical Fields. *Topics in Catalysis* **2025**, DOI: 10.1007/s11244-025-02062-7.

(5) Bogaerts, A.; Centi, G.; Hessel, V.; Rebrov, E. Perspectives and Emerging Trends in Plasma Catalysis: Facing the Challenge of Chemical Production Electrification. *ChemCatChem* **2025**, *17* , e202401938.

(6) AM Ronsisvalle, D Giusi, M Samperi, C Genovese, S Perathoner, G Centi, C Ampelli, Does the presence of only specific active sites control the switch of selectivity from C1 to C2+ products in CO2RR? *J. CO_2 Utilization* **2025**, *100*, 103188

(7) D Chillè, G Papanikolaou, P Squillaci, S Abate, C Cannilla, P Lanzafame, S Perathoner, G Centi, Metal-free (B, N, P)-doped ordered mesoporous carbons for enhanced electrocatalytic oxidation of phenol, *Applied Catalysis O: Open*, **2025**, 207067, DOI: 10.1016/j.apcato.2025.207067

(8) M Miceli, F Tavella, D Giusi, ME Tefera, MF Torre, S Perathoner, G Centi, C Ampelli, Activation of Dinitrogen Molecule (N2) in Unconventional Electrochemical Reactors for Ammonia Production, *Chem. Eng. Trans*. **2025**, *117*, 733-738

(9) S Li, J Ma, N Wang, X Liu, W Cui, Y Lyu, S Perathoner, G Centi, Y Liu, Engineering dual-active sites on CeO_x-modified defective MgO for efficient CO_2 thermocatalytic reduction, *J Energy Chemistry* **2025**, *110*, 486-496

(10) V Longo, S Perathoner, G Centi, C Genovese, Mitigation of C-deposits in plasma-assisted non-oxidative methane coupling using a water-cooled double dielectric barrier discharge reactor, *Chem. Eng. J.* **2025**, 164334

(11) M Usman, MH Suliman, M Abdinejad, J Kok, H Al Naji, A Helal, ZH Yamani, G Centi, Highly efficient CO_2 electroreduction to formate using Bismuth nanodots within ZIF-8 scaffold, *Carbon Capture Science & Techn* **2025**, 16, 100450

(12) X Ren, J Huang, J Ma, Y Zhang, W Chu, S Perathoner, G Centi, Y Liu, Boosting the activity in the liquid-phase hydrogenation of S-containing nitroarenes by dual-site Pt/CeO_2 catalysts design, *Nature Comm* **2025**, *16*, 4851

(13) FP Abramo, G Giorgianni, S Perathoner, G Centi, F Gallucci, S Abate, Unlocking the impact of electrode porosity on CO_2 splitting efficiency in porous DBD plasma reactors*, Chem Eng J* **2025**, *512*, 162608

(14) J Ma, B Xu, S Cao, S Li, W Chu, S Perathoner, G Centi, Y Liu, Structural dynamics of Ni/Mo_2CT_x MXene catalysts under reaction modulate CO_2 reduction performance, *Chin J Catal* **2025**, *72*, 243-253

(15) A Bogaerts, G Centi, JC Hicks, Introduction to understanding and new approaches to create synergy between catalysis and plasma themed collection, *EES Catal* **2025**, *3*, 592-594

(16) V Longo, L De Pasquale, S Perathoner, G Centi, C Genovese, Synergistic effects of light and plasma catalysis on Au-modified TiO_2 nanotube arrays for enhanced non-oxidative coupling of methane, *Catalysis Science & Techn* **2025**, *15*, 3725-3735

2024

(17) Wang, J.; Li, Y.; Hummel, C.; Huang, G.; Ji, X.; Demiröz, E.; Urakawa, A.; Huang, S.; Zhao, R.; Lercher, J. Electrocatalytic Production of a Liquid Organic Hydrogen Carrier with Anodic Valorization of the Process: Review and Outlook. *Energy & Fuels* **2024**, *39* (1), 132-165.

(18) Verduci, R.; Creazzo, F.; Tavella, F.; Abate, S.; Ampelli, C.; Luber, S.; Perathoner, S.; Cassone, G.; Centi, G.; D'Angelo, G. Water structure in the first layers on TiO_2: a key factor for boosting solar-driven water-splitting performances. *Journal of the American Chemical Society* **2024**, *146* (26), 18061-18073.

(19) Tuci, G.; Rossin, A.; Saki, Z.; Caporaso, L.; Liu, Y.; Centi, G.; Giambastiani, G. The Still Elusive Role of Lightweight Doping in Carbon-Based Electrocatalysts for the Selective Oxygen Reduction Reaction to Hydrogen Peroxide. *ChemSusChem* **2024**, *17* (22), e202400660.

(20) Serrano, D. P.; Centi, G.; Diddams, P. A.; Čejka, J. Outlooks for zeolite catalysts in a low-carbon scenario. *Catalysis Today* **2024**, *426*, 114365.

(21) Papanikolaou, G.; Centi, G.; Perathoner, S.; Lanzafame, P. Green synthesis and sustainable processing routes. *Current Opinion in Green and Sustainable Chemistry* **2024**, 100918.

(22) Maccarrone, D.; Giorgianni, G.; Italiano, C.; Perathoner, S.; Centi, G.; Abate, S. Comparative analysis of hydrogen production from ammonia decomposition in membrane and packed bed reactors using diluted NH3 streams. *International Journal of Hydrogen Energy* **2024**, *82*, 513-522.

(23) Ma, J.; Jiang, Q.; Li, S.; Chu, W.; Qian, H.; Perathoner, S.; Centi, G.; Liu, Y. High-dispersed CeOx species on mesopores silica to accelerate Ni-catalysed CO_2 methanation at low temperatures. *Chemical Engineering Journal* **2024**, *479*, 147453.

(24) Longo, V.; De Pasquale, L.; Tavella, F.; Barawi, M.; Gomez-Mendoza, M.; de la Peña O'Shea, V.; Ampelli, C.; Perathoner, S.; Centi, G.; Genovese, C. High photocatalytic yield in the non-oxidative coupling of methane using a Pd–TiO2 nanomembrane gas flow-through reactor. *EES catalysis* **2024**, *2* (5), 1164-1175.

(25) Longo, V.; Centi, G.; Perathoner, S.; Genovese, C. CO_2 utilisation with plasma technologies. *Current Opinion in Green and Sustainable Chemistry* **2024**, *46*, 100893.

(26) Kang, H.; Ma, L.; Li, S.; Chen, X.; Chu, W.; Zhang, R.; Perathoner, S.; Centi, G.; Liu, Y. Oxygen vacancy-dependent chemical intermediates on Ru/MnO catalysts dictate the selectivity of CO2 reduction. *Applied Catalysis B: Environment and Energy* **2024**, *352*, 124010.

(27) Giorgianni, G.; Van Putten, R.-J.; Van Der Waal, J. C.; Perathoner, S.; Centi, G.; Abate, S. The Conversion of 5-chloromethylfurfural Into 5-methoxymethylfurfural via Nucleophilic Substitution: Kinetic Modelling. *Chemical Engineering Transactions* **2024**, *109*, 265-270.

(28) Centi, G.; Perathoner, S. Reduction of Non-CO_2 Greenhouse Gas Emissions by Catalytic Processes. In *Handbook of Climate Change Mitigation and Adaptation*, Springer, **2024**; pp 1-43.

(29) Centi, G.; Perathoner, S. CO_2 Electrocatalytic Conversion: Outlooks, Pitfalls and Scientific Gaps. In *Advances in CO2 Utilization: From Fundamentals to Applications*, Springer Nature Singapore Singapore, **2024**; pp 133-155.

(30) Centi, G.; Perathoner, S. Rethinking chemical production with "green" hydrogen. *Pure and Applied Chemistry* **2024**, *96* (4), 471-477.

(31) Centi, G.; Perathoner, S. Making chemicals from the air: the new frontier for hybrid electrosyntheses in artificial tree-like devices. *Green Chemistry* **2024**, *26* (1), 15-41.

(32) Centi, G.; Liu, Y.; Perathoner, S. Catalysis for Carbon-Circularity: Emerging Concepts and Role of Inorganic Chemistry. *ChemSusChem* **2024**, *17* (21), e202400843.

(33) Centi, G.; Ampelli, C. CO2 conversion to solar fuels and chemicals: Opening the new paths. *Journal of Energy Chemistry* **2024**, *91*, 680-683.

(34) Abramo, F. P.; De Luca, F.; Chiodoni, A.; Centi, G.; Giorgianni, G.; Italiano, C.; Perathoner, S.; Abate, S. Nanostructure-performance relationships in titania-only electrodes for the selective electrocatalytic hydrogenation of oxalic acid. *Journal of Catalysis* **2024**, *429*, 115277.

2023

(35) Tavella, F.; Genovese, C.; Pineda, F. A. G.; Centi, G.; Perathoner, S.; Ampelli, C. Tantalum oxynitride nanotube film arrays for unconventional nanostructured photo-electrodes active with visible light. *Catalysis Today* **2023**, *418*, 114146.

(36) Passalacqua, R.; Abate, S.; De Luca, F.; Perathoner, S.; Centi, G. Graphitic Layered Structures Enhancing TiNT Catalyst Photo-Electrochemical Behaviour. *Coatings* **2023**, *13* (2), 358.

(37) Papanikolaou, G., Chillè, D., Perathoner, S., Centi, G.; Migliori, M.; Giordano, G., Lanzafame, P. Use of zeolites in green chemicals and bio-fuel production via HMF valorisation. *Microporous and Mesoporous Materials* **2023**, *418*, 114146.

(38) Mebrahtu, C.; Krebs, F.; Giorgianni, G.; Abate, S.; Perathoner, S.; Centi, G.; Large, A. I.; Held, G.; Arrigo, R.; Palkovits, R. Insights by in-situ studies on the nature of highly-active hydrotalcite-based Ni-Fe catalysts for CO_2 methanation. *Chemical Engineering Research and Design* **2023**, *193*, 320-339.

(39) Marino, A.; Catizzone, E.; Migliori, M.; Ferrarelli, G.; Aloise, A.; Chillè, D.; Papanikolaou, G.; Lanzafame, P.; Perathoner, S.; Centi, G. Hydrothermal synthesis and catalytic assessment of high-silica (B, Fe)-beta zeolites. *Crystal Growth & Design* **2023**, *23* (4), 2988-3001.

(40) Kang, H.; Zhu, L.; Li, S.; Yu, S.; Niu, Y.; Zhang, B.; Chu, W.; Liu, X.; Perathoner, S.; Centi, G. Generation of oxide surface patches promoting H-spillover in Ru/(TiO_x) MnO catalysts enables CO_2 reduction to CO. *Nature Catalysis* **2023**, *6* (11), 1062-1072.

(41) Kang, H.; Ma, J.; Perathoner, S.; Chu, W.; Centi, G.; Liu, Y. Understanding the complexity in bridging thermal and electrocatalytic methanation of CO_2. *Chemical Society Reviews* **2023**, *52*, 3627-3662.

(42) Gu, Q.; Huang, R.; Xu, C.; Li, S.; Perathoner, S.; Centi, G.; Liu, Y. Nanodiamond derived N-doped sp^3@sp^2 hybrid

carbocatalysts for the aerobic oxidative synthesis of 2-substituted benzoxazoles. *Chemical Synthesis* **2023**, *3* (3), N/A-N/A.

(43) Giorgianni, G.; Perathoner, S.; Centi, G.; Soo-Tang, S.-H.; de Jong, E.; van der Waal, J. C.; Abate, S. Exploring the hydrogenation of furfural in the liquid phase by high-throughput screening of commercial catalysts: Effects of temperature, solvents, and promoters on the production of 2-methylfuran. *Chemical Engineering Research and Design* **2023**, *197*, 968-983.

(44) Gianolio, D., Higham, M.D., Quesne, M.G., Aramini, M.; Xu, R.; Large, A. I.; Held, G.; Velasco-Vélez, J.-J.; Haevecker, M.; Knop-Gericke, A.; Genovese, C.; Ampelli, C.; Schuster, M. E. Interfacial Chemistry in the Electrocatalytic Hydrogenation of CO_2 over C-Supported Cu-Based Systems. *ACS Catalysis* **2023**, *13* (9), 5876-5895.

(45) Fasolini, A.; Mafessanti, R.; Abate, S.; Gramazio, P.; De Maron, J.; Centi, G.; Basile, F. Integration of catalytic methane oxy-reforming and water gas shift membrane reactor for intensified pure hydrogen production and methanation suppression over $Ce_{0.5}Zr_{0.5}O_2$ based catalysts. *Catalysis Today* **2023**, *418*, 114047.

(46) Din, I. U.; Alotaibi, M. A.; Alharthi, A. I.; Naeem, A.; Centi, G. Synthesis, characterization and activity of CeO_2 supported Cu-Mg bimetallic catalysts for CO_2 to methanol. *Chemical Engineering Research and Design* **2023**, *192*, 158-166.

(47) De Pasquale, L.; Tavella, F.; Longo, V.; Favaro, M.; Perathoner, S.; Centi, G.; Ampelli, C.; Genovese, C. The role of substrate surface geometry in the photo-electrochemical behaviour of supported TiO2 nanotube arrays: a study using electrochemical impedance spectroscopy (EIS). *Molecules* **2023**, *28* (8), 3378.

(48) Centi, G.; Perathoner, S.; Genovese, C.; Arrigo, R. Advanced (photo) electrocatalytic approaches to substitute the use of fossil fuels in chemical production. *Chemical Communications* **2023**, *59* (21), 3005-3023.

(49) Centi, G.; Perathoner, S. The chemical engineering aspects of CO_2 capture, combined with its utilisation. *Current Opinion in Chemical Engineering* **2023**, *39*, 100879.

(50) Centi, G.; Perathoner, S. Catalysis for an electrified chemical production. *Catalysis Today* **2023**, *423*, 113935.

(51) Centi, G.; Liu, Y. Editorial overview: Electrochemical synthesis 2022. *Current Opinion in Green and Sustainable Chemistry* **2023**, *39*, 100735.

(52) Bogaerts, A.; Centi, G.; Hessel, V.; Rebrov, E. Challenges in unconventional catalysis. *Catalysis Today* **2023**, *420*, 114180.

(53) Appolloni, A.; Centi, G.; Yang, N. Promoting carbon circularity for a sustainable and resilience fashion industry. *Current Opinion in Green and Sustainable Chemistry* **2023**, *39*, 100719.

(54) Ampelli, C.; Tavella, F.; Giusi, D.; Ronsisvalle, A. M.; Perathoner, S.; Centi, G. Electrode and cell design for CO_2 reduction: A viewpoint. *Catalysis Today* **2023**, *421*, 114217.

(55) Ampelli, C.; Giusi, D.; Miceli, M.; Merdzhanova, T.; Smirnov, V.; Chime, U.; Astakhov, O.; Martín, A. J.; Veenstra, F. L. P.; Pineda, F. A. G. An artificial leaf device built with earth-abundant materials for combined H_2 production and storage as formate with efficiency> 10%. *Energy & Environmental Science* **2023**, *16* (4), 1644-1661.

2022

(56) Tabandeh, M.; Cheng, C. K.; Centi, G.; Show, P. L.; Chen, W.-H.; Ling, T. C.; Ong, H. C.; Ng, E.-P.; Juan, J. C.; Lam, S. S. Recent advancement in deoxygenation of fatty acids via homogeneous catalysis for biofuel production. *Molecular Catalysis* **2022**, *523*, 111207.

(57) Papanikolaou, G.; Chille, D.; Abate, S.; Perathoner, S.; Centi, G.; Giorgianni, G.; Cozza, D.; Dalena, F.; Migliori, M.; Giordano, G. Zeolite templated carbon from Beta replica as metal-free electrocatalyst for CO_2 reduction. *Applied Materials Today* **2022**, *26*, 101383.

(58) Papanikolaou, G.; Centi, G.; Perathoner, S.; Lanzafame, P. Catalysis for e-chemistry: need and gaps for a future de-fossilized chemical production, with focus on the role of complex (direct) syntheses by electrocatalysis. *ACS catalysis* **2022**, *12* (5), 2861-2876.

(59) Giusi, D.; Miceli, M.; Genovese, C.; Centi, G.; Perathoner, S.; Ampelli, C. In situ electrochemical characterization of Cu_xO-based gas-diffusion electrodes (GDEs) for CO_2 electrocatalytic reduction in presence and absence of liquid electrolyte and relationship with C2+ products formation. *Applied Catalysis B: Environmental* **2022**, *318*, 121845.

(60) Giorgianni, G.; Mebrahtu, C.; Perathoner, S.; Centi, G.; Abate, S. Hydrogenation of dimethyl oxalate to ethylene glycol on Cu/SiO_2 catalysts prepared by a deposition-decomposition method: Optimization of the operating conditions and pre-reduction procedure. *Catalysis Today* **2022**, *390*, 343-353.

(61) Demet, A. E.; Gimello, O.; Arletti, R.; Tanchoux, N.; Sougrati, M. T.; Stievano, L.; Quignard, F.; Centi, G.; Perathoner, S.; Di Renzo, F. 5-Hydroxymethylfurfural oxidation to 2, 5-furandicarboxylic acid on noble metal-free nanocrystalline mixed oxide catalysts. *Catalysts* **2022**, *12* (8), 814.

(62) Centi, G.; Perathoner, S.; Salladini, A. laquaniello G (2020) Economics of CO_2 Utilization: A Critical Analysis. Front. *Beyond Current Research Trends in CO2 Utilization* **2022**, *8*, 560849109.

(63) Centi, G.; Perathoner, S. Turning CO_2 into fuels and chemicals: An introduction. Chemical Valorisation of Carbon Dioxide, Edited by Georgios Stefanidis; Andrzej Stankiewicz, RCS **2022**, pp. 1 - 18.

(64) Centi, G.; Perathoner, S. Status and gaps toward fossil-free sustainable chemical production. *Green Chemistry* **2022**, *24* (19), 7305-7331.

(65) Centi, G.; Perathoner, S. Catalytic Technologies for the Conversion and Reuse of CO_2. In *Handbook of Climate Change Mitigation and Adaptation*, Springer International Publishing Cham, **2022**; pp 1803-1852.

(66) Centi, G.; Perathoner, S. Revealing the role of edges in the electrocatalytic synthesis of H2O2 over metal-free nanocarbon. *Chem Catalysis* **2022**, *2* (6), 1251-1253.

(67) Centi, G.; Perathoner, S. Reduction of Non-CO2 Greenhouse Gas Emissions by Catalytic Processes. In *Handbook of Climate Change Mitigation and Adaptation*, Springer International Publishing Cham, **2022**; pp 1759-1802.

(68) Centi, G.; Perathoner, S. Photoelectrocatalytic CO_2 Activation Toward Artificial Leaves: Outlooks and Needs of a System Approach. In *Chemical Energy Storage*, De Gruyter, **2022**; pp 499-536.

(69) Centi, G.; Perathoner, S. Redesign chemical processes to substitute the use of fossil fuels: A viewpoint of the implications on catalysis. *Catalysis Today* **2022**, *387*, 216-223.

(70) Centi, G. Across the board: Gabriele Centi on decoupling electrocatalytic reactions to electrify chemical production. *ChemSusChem* **2022**, *15* (4), e202200007.

(71) Centi, G. Controlled location of S vacancies in MoS_2 nanosheets for high-performance hydrogenation of CO2 to methanol. *Journal of Energy Chemistry* **2022**, *64*, 113-115.

(72) Borgogna, A.; Centi, G.; Iaquaniello, G.; Perathoner, S.; Papanikolaou, G.; Salladini, A. Assessment of hydrogen production from municipal solid wastes as competitive route to produce low-carbon H_2. *Science of The Total Environment* **2022**, *827*, 154393.

(73) Abramo, F. P.; De Luca, F.; Passalacqua, R.; Centi, G.; Giorgianni, G.; Perathoner, S.; Abate, S. Electrocatalytic production of glycolic acid via oxalic acid reduction on titania debris supported on a TiO_2 nanotube array. *Journal of Energy Chemistry* **2022**, *68*, 669-678.

2021

(74) Romano, V.; D'Angelo, G.; Perathoner, S.; Centi, G. Current density in solar fuel technologies. *Energy & Environmental Science* **2021**, *14* (11), 5760-5787.

(75) Perini, J. A. L.; Tavella, F.; Neto, E. P. F.; Zanoni, M. V. B.; Ribeiro, S. J. L.; Giusi, D.; Centi, G.; Perathoner, S.; Ampelli, C. Role of nanostructure in the behaviour of $BiVO_4$–TiO_2 nanotube photoanodes for solar water splitting in relation to operational conditions. *Solar Energy Materials and Solar Cells* **2021**, *223*, 110980.

(76) Perathoner, S.; Van Geem, K. M.; Marin, G. B.; Centi, G. Reuse of CO_2 in energy intensive process industries. *Chemical Communications* **2021**, *57* (84), 10967-10982.

(77) Passalacqua, R.; Pellicano, L. C.; Abate, S.; Perathoner, S.; Centi, G. NiFe Oxide Catalysts for Electro-Oxidation of Glucose. *Energy* **2021**, *5000*, 6000.

(78) Passalacqua, R.; Abate, S.; Perathoner, S.; Centi, G. Improved Nanocomposite Photoanodes by Controlled Deposition of gC_3N_4 on Titania Nanotube Ordered Films. *CHEMICAL ENGINEERING* **2021**, *84*, 25-30.

(79) Papanikolaou, G.; Lanzafame, P.; Perathoner, S.; Centi, G.; Cozza, D.; Giorgianni, G.; Migliori, M.; Giordano, G. High performance of Au/ZTC based catalysts for the selective oxidation of bio-derivative furfural to 2-furoic acid. *Catalysis Communications* **2021**, *149*, 106234.

(80) Marepally, B.; Ampelli, C.; Genovese, C.; Sayah, R.; Veyre, L.; Dalverny, C.; Thieuleux, C.; Quadrelli, E.; Perathoner, S.; Centi, G. Supported metallic nanoparticles prepared by an organometallic route to boost the electrocatalytic conversion of CO_2. *Journal of CO_2 Utilization* **2021**, *50*, 101613.

(81) Ma, J.; Jiang, Q.; Zhou, Y.; Chu, W.; Perathoner, S.; Jiang, C.; Wu, K. H.; Centi, G.; Liu, Y. Tuning the chemical properties of Co–$Ti_3C_2T_x$ MXene materials for catalytic CO2 reduction. *Small* **2021**, *17* (26), 2007509.

(82) Giusi, D.; Tavella, F.; Miceli, M.; Ampelli, C.; Centi, G.; Cosio, D.; Genovese, C.; Perathoner, S. Synergetic Electrocatalytic Effects of Cu_2O-TiO_2 Heterostructures in a Solar Driven PEC Device for CO_2 Reduction to> C1 Chemicals. *Chemical Engineering Transactions* **2021**, *86*, 1405-1410.

(83) Giusi, D.; Ampelli, C.; Genovese, C.; Perathoner, S.; Centi, G. A novel gas flow-through photocatalytic reactor based on copper-functionalized nanomembranes for the photoreduction of CO_2 to C1-C2 carboxylic acids and C1-C3 alcohols. *Chemical Engineering Journal* **2021**, *408*, 127250.

(84) Din, I. U.; Usman, M.; Khan, S.; Helal, A.; Alotaibi, M. A.; Alharthi, A. I.; Centi, G. Prospects for a green methanol thermo-catalytic process from CO_2 by using MOFs based materials: A mini-review. *Journal of CO_2 Utilization* **2021**, *43*, 101361.

(85) De Luca, F.; Passalacqua, R.; Abramo, F. P.; Perathoner, S.; Centi, G.; Abate, S. gC_3N_4 Decorated TiO_2 Nanotube Ordered

Thin Films as Cathodic Electrodes for the Selective Reduction of Oxalic Acid. *CHEMICAL ENGINEERING* **2021**, *84*, 37-42.

(86) Centi, G.; Perathoner, S.; Papanikolaou, G. Plasma assisted CO_2 splitting to carbon and oxygen: A concept review analysis. *Journal of CO_2 Utilization* **2021**, *54*, 101775.

(87) Centi, G.; Perathoner, S. 1 Applications of hydrogen technologies and their role for a sustainable future. In *Utilization of Hydrogen for Sustainable Energy and Fuels*, Vol. 3; De Gruyter Pub. Berlin, **2021**; pp 137-156.

(88) Centi, G.; Perathoner, S. Nanocarbon for energy material applications: N2 reduction reaction. *Small* **2021**, *17* (48), 2007055.

(89) Arrigo, R.; Blume, R.; Streibel, V.; Genovese, C.; Roldan, A.; Schuster, M. E.; Ampelli, C.; Perathoner, S.; Velasco Vélez, J. J.; Hävecker, M. Dynamics at polarized carbon dioxide–iron oxyhydroxide interfaces unveil the origin of multicarbon product formation. *ACS Catalysis* **2021**, *12* (1), 411-430.

(90) Alotaibi, M. A.; Din, I. U.; Alharthi, A. I.; Bakht, M. A.; Centi, G.; Shaharun, M. S.; Naeem, A. Green methanol synthesis by catalytic CO2 hydrogenation, deciphering the role of metal-metal interaction. *Sustainable Chemistry and Pharmacy* **2021**, *21*, 100420.

(91) Alotaibi, M. A.; Din, I. U.; Alharthi, A. I.; Ahmad, P.; Naeem, A.; ElSayed, I.; Centi, G. Synthesis, characterization, and magnetic behavior of cobalt-ferrite nanoparticles under variant temperature conditions. *Physics of the Solid State* **2021**, *63* (4), 519-524.

(92) Alharthi, A. I.; Din, I. U.; Alotaibi, M. A.; Centi, G. Application of cobalt ferrite nano-catalysts for methanol synthesis by CO2 hydrogenation: deciphering the role of metals cations distribution. *Ceramics International* **2021**, *47* (13), 19234-19240.

2020

(93) Wu, K. H.; Zhang, Q.; Lin, Y.; Ali, M. A.; Zhao, S.; Heumann, S.; Centi, G. Real-Time Carbon Monoxide Detection using a Rotating Gold Ring Electrode: A Feasibility Study. *ChemElectroChem* **2020**, *7* (21), 4417-4422.

(94) Wei, H.; Ma, Y.; Luo, J.; Wu, K.-H.; Xie, W.; Wen, G.; Chiang, C.-L.; Yan, W.; Perathoner, S.; Centi, G. Creation of NC= O active groups on N-doped CNT as an efficient CarboCatalyst for solvent-free aerobic coupling of benzylamine. *Carbon* **2020**, *170*, 338-346.

(95) Wei, H.; Jiang, Q.; Ampelli, C.; Chen, S.; Perathoner, S.; Liu, Y.; Centi, G. Cover Feature: Enhancing N2 Fixation Activity by Converting Ti_3C_2 MXenes Nanosheets to Nanoribbons (ChemSusChem 21/2020). *ChemSusChem* **2020**, *13* (21), 5597-5597.

(96) Wei, H.; Jiang, Q.; Ampelli, C.; Chen, S.; Perathoner, S.; Liu, Y.; Centi, G. Enhancing N_2 fixation activity by converting Ti3C2 MXenes nanosheets to nanoribbons. *ChemSusChem* **2020**, *13* (21), 5614-5619.

(97) Perathoner, S.; Centi, G. Artificial leaves using sunlight to produce fuels. In *Studies in Surface Science and Catalysis*, Vol. 179; Elsevier, **2020**; pp 415-430.

(98) Papanikolaou, G.; Lanzafame, P.; Giorgianni, G.; Abate, S.; Perathoner, S.; Centi, G. Highly selective bifunctional Ni zeo-type catalysts for hydroprocessing of methyl palmitate to green diesel. *Catalysis Today* **2020**, *345*, 14-21.

(99) Marepally, B. C.; Ampelli, C.; Genovese, C.; Tavella, F.; Quadrelli, E. A.; Perathoner, S.; Centi, G. Electrocatalytic reduction of CO_2 over dendritic-type Cu-and Fe-based electrodes prepared by electrodeposition. *Journal of CO_2 Utilization* **2020**, *35*, 194-204.

(100) Mallamace, D.; Papanikolaou, G.; Perathoner, S.; Centi, G.; Lanzafame, P. Comparing molecular mechanisms in solar NH3 production and relations with CO_2 reduction. *International Journal of Molecular Sciences* **2020**, *22* (1), 139.

(101) Lanzafame, P.; Papanikolaou, G.; Perathoner, S.; Centi, G.; Giordano, G.; Migliori, M. Weakly acidic zeolites: A review on uses and relationship between nature of the active sites and catalytic behaviour. *Microporous and Mesoporous Materials* **2020**, *300*, 110157.

(102) Giorgianni, G.; Mebrahtu, C.; Schuster, M. E.; Large, A. I.; Held, G.; Ferrer, P.; Venturini, F.; Grinter, D.; Palkovits, R.; Perathoner, S. Elucidating the mechanism of the CO_2 methanation reaction over Ni–Fe hydrotalcite-derived catalysts via surface-sensitive in situ XPS and NEXAFS. *Physical Chemistry Chemical Physics* **2020**, *22* (34), 18788-18797.

(103) Choo, M.-Y.; Oi, L. E.; Ling, T. C.; Ng, E.-P.; Lin, Y.-C.; Centi, G.; Juan, J. C. Deoxygenation of triolein to green diesel in the H2-free condition: Effect of transition metal oxide supported on zeolite Y. *Journal of Analytical and Applied Pyrolysis* **2020**, *147*, 104797.

(104) Choo, M.-Y.; Oi, L. E.; Daou, T. J.; Ling, T. C.; Lin, Y.-C.; Centi, G.; Ng, E.-P.; Juan, J. C. Deposition of NiO nanoparticles on nanosized zeolite NaY for production of biofuel via hydrogen-free deoxygenation. *Materials* **2020**, *13* (14), 3104.

(105) Chen, S.; Perathoner, S.; Ampelli, C.; Wei, H.; Abate, S.; Zhang, B.; Centi, G. Direct synthesis of ammonia from N_2 and H_2O on different iron species supported on carbon nanotubes using a gas-phase electrocatalytic flow reactor. *ChemElectroChem* **2020**, *7* (14), 3028-3037.

(106) Chen, S.; Perathoner, S.; Ampelli, C.; Wei, H.; Abate, S.; Zhang, B.; Centi, G. Enhanced performance in the direct electrocatalytic synthesis of ammonia from N_2 and H_2O by an in-situ electrochemical activation of CNT-supported iron oxide nanoparticles. *Journal of Energy Chemistry* **2020**, *49*, 22-32.

(107) Centi, G.; Perathoner, S.; Salladini, A.; Iaquaniello, G. Economics of CO_2 Utilization: A Critical Analysis. Front. *Frontiers in Energy Research* **2020**, *8*, 567986.

(108) Centi, G.; Perathoner, S. Chemistry and energy beyond fossil fuels. A perspective view on the role of syngas from waste sources. *Catalysis Today* **2020**, *342*, 4-12.

(109) Centi, G. Smart Catalytic Materials for Energy Transition. *Smartmat* **2020**, e1005.

(110) Centi, G. Catalysis to Go Beyond the Use of Fossil Fuels: A Dream or an Effective Possibility? *The Catalyst Review* **2020**, *10*, 6-15.

(111) Bogaerts, A.; Tu, X.; Whitehead, J. C.; Centi, G.; Lefferts, L.; Guaitella, O.; Azzolina-Jury, F.; Kim, H.-H.; Murphy, A. B.; Schneider, W. F. The 2020 plasma catalysis roadmap. *Journal of physics D: applied physics* **2020**, *53* (44), 443001.

(112) Bogaerts, A.; Centi, G. Plasma Technology for CO_2 Conversion: A Personal Perspective on Prospects and Gaps. Front. *Frontiers in Energy Research* **2020**, *8*, 111.

(113) Basile, A.; Centi, G.; De Falco, M.; Iaquaniello, G. The vision of future sustainable energy, catalyst, and chemistry: opportunities for innovation and business. In *Studies in Surface Science and Catalysis*, Vol. 179; Elsevier, **2020**; pp 7-20.