

Jonathan Filippi

Curriculum Vitae

BASIC INFORMATION:

- *First Name:* Jonathan
- *Last Name:* Filippi
- *Birthplace:* Prato (PO), Italy
- *Birthdate:* 09/06/1982
- *Nationality:* Italian

CONTACT INFORMATION:

- *Home address:* Via Verbano 14, Prato (PO), 5910, Italy
- *Work adress:* ICCOM-CNR, Institute of Chemistry of Organometallic Complex – National Research Council, Via Madonna del Piano 10, 50019, Sesto Fiorentino, Italy
- *E-mail:* jonathan.filippi@iccom.cnr.it
- *Phone:* +39 055 522 5228
- *Mobile:* +39 333 8720361

WEB: [HTTP://WWW.ICCOM.CNR.IT/INDEX.PHP/IT/ISTITUTO/PERSONALE2?VIEW=MEMBER&TASK=SHOW&ID=228](http://www.iccom.cnr.it/index.php/it/istituto/personale2?view=member&task=show&id=228)

BIBLIOMETRIC DATA (3-14-2022, SCOPUS):

- *ORCID:* [0000-0002-4939-9417](https://orcid.org/0000-0002-4939-9417)
- *H-Index:* 23
- *Documents:* 53
- *Total Citations:* 2302 in 1717 documents

EDUCATION AND TRAINING:

- **2012:** PhD in Chemical Sciences, University of Florence and the Institute of organometallic compounds (ICCOM), Italy
- **2007:** Master Degree, University of Florence, Italy
- **2004:** Bachelor's Degree, University of Florence, Italy
- **2001:** Diploma in industrial chemistry attained at the Industrial Tecnical Institute "Tullio Buzzi" of Prato

EXPERIENCES, POSITIONS AND FELLOWSHIPS:

- **2016–present:** Full time researcher at the Institute of Chemistry of Organometallic Compounds (ICCOM), Department of Chemical Sciences and Materials Technology (DSCMT) / National Research Council (CNR) / Italy
- **2014:** Visiting Scholar at the Department of Material Science of the Virginia University (UVa), Charlottesville (VA), USA, for a collaboration in the field of materials for the CO₂ electroreduction with Prof. Giovanni Zangari.
- **2012-2016:** Fixed-time researcher (4 years contract) in the FIRB 2010 project "Future in research" project tytle: "Synthesis and characterization of structure, morfology and electrochemical

properties for electrocatalytic materials for the CO₂ electroreduction reaction". 2 July 2012- 30 december 2016

- **2012:** 4 month Postdoc Research Grant funded by Worgas "Developement of power generators based on hydrogen fuel cell stacks fed with gaseous or combined hydrogen" 15 February 2012 - 30 June 2012.
- **2009-2012:** PhD student in the XXIV cycle of PhD in Chemical Sciences at the University of Florence and the Institute of organometallic compounds (ICCOM) CNR, tutor dott. Francesco Vizza.
- **2008:** Three month research grant) at the Institute of organometallic compounds (ICCOM), on FISIR project under the scientific direction of dott. Francesco Vizza
- **2007:** One year research grant at the Institute of organometallic compounds (ICCOM) on "EBH2: Elettro-Bio-Idrogeno" project, funded by Regione Toscana under the scientific direction of dr. Francesco Vizza

BRIEF TRACK RECORD:

Jonathan Filippi obtained his Bachelor's degree in chemistry 2004 and his Master's degree in chemistry on April 2007 at the University of Florence in September. In October 2008 he begun a 1-year grant at the Institute of Chemistry of Organometallic Compounds (ICCOM) of the Italian National Research Council (CNR) in Sesto Fiorentino. During 2009-2012 he become a PhD student in Chemical Sciences. After the PhD he begun a time limited (four year) research contract at the Institute of Chemistry of Organometallic Compounds (ICCOM) of the Italian National Research Council (CNR) in Sesto Fiorentino funded by Project FIRB 2010 "Synthesis and characterization of structure, morphology and electrochemical properties for electrocatalytic materials for the CO₂ electroreduction reaction". After the end of the project (2016) he obtained a permanent position as researcher at the Italian National Research Council (CNR). After his master thesis Jonathan has investigated electrochemistry, and electrocatalysis for fuel cells and hydrogen electrolyzers. During the PhD he investigated many aspects of heterogeneous catalysis and electrocatalysis, including oxygen reduction reaction, alcohol oxidation reaction, using techniques as cyclic voltammetry, linear scans, RDE experiments, full cell assembly and electrocatalyst characterization such as XRD, porosimetry and TEM/SEM microscopy . During this period he also has collaborated with industrial partners such as Worgas for the development of portable energy generation apparatus based on on-demand hydrogen production from sodium borohydride hydrolysis that resulted in the development of four industrial innovation patents. During the 4 year time-limited researcher (FIRB2010) contract he has investigated many aspects of energy storage and CO₂ utilization; in particular he studied the electroreduction of CO₂ to value added products, such as carbon monoxide, methane, ethylene and formic acid. Jonathan was also a visiting scholar (J1) at the University of Virginia, material science department for a collaboration with Prof. Giovanni Zangari. Furthermore, since 2015 (this research line is currently active), his activity was extended into the lithium battery recycle and metal recovery research, in particular in hydrometallurgy in collaboration with the Italian Mandatory Battery Collection Consortium (COBAT) that resulted in the development of a process innovation patent ("Hydrometallurgic processes for the treatment of lithium batteries and recovery of the metals contained therein". PCT/IT2019/050013) and gaining

expertise in hydrometallurgy, material treatment, battery safety procedures and life cycle assessment.

PROJECTS:

1. Name: “Accordo di programma MiTE-ENEA PNRR Investimento 3.5 – Ricerca e Sviluppo sull’Idrogeno”
Assignment: ICCOM UNIT, 1.1.24, Scientific Responsibility “Sviluppo di materiali e processi innovativi di elettroreforming di alcoli finalizzati alla produzione di idrogeno”
Unit Funding: 160.000
PI: Dr. Francesco Vizza
2. Name: “Membrane alcaline e catalizzatori privi di metalli del gruppo del platino per dispositivi elettrochimici aperti di nuova generazione per l'immagazzinamento e la conversione di energia” FISR2019_01294
Assignment: ICCOM UNIT Scientific Responsibility
Funding Institution: MIUR
Total funding: 1.656.000 €
Unit Funding: 560.000€
PI: Dr. Francesco Vizza
3. Name: “Capitale naturale e risorse per il futuro dell’Italia” codice PdGP DTA.AD005.314”
Assignment: ICCOM UNIT Scientific Responsibility
Funding Institution: FOE 2020
PI: Dr. Francesco Vizza
4. Name: “Transformation of plastic waste in Electrocatalysts, Supported by exhausted gases recovery Layout (TESLA)”
Assignment: ICCOM UNIT leader (WP3)
Funding Institution: Fondazione CARIPLO
Total funding: 300000 €
Unit Funding: 58500 €
PI: Dr. Carlo Santoro
5. Name: “RELIABLE: Recupero dei metalli da Batterie al Litio esauste”
Assignment: involved Researcher
Funding Institution: Consiglio Nazionale Delle Ricerche - CNR
Total funding: 106440 €
Unit Funding: 106440 €
PI: Dr. Andrea Marchionni
6. Name: “Firenze Hydrolab 2 : l'idrogeno come vettore energetico. nuove prospettive per la produzione, lo storage e la sua utilizzazione in area fiorentina”
Assignment: involved Researcher
Funding Institution: ECRF (Ente Cassa Risparmio Firenze)

Total funding: 145000 €

Unit Funding: 145000 €

PI: Dr. Maurizio Peruzzini

7. Name: “Bando FIRB – (programma “Futuro in Ricerca”) “Un approccio innovativo, mediante spettroscopia laser e caratterizzazione su scala atomica, al design di materiali catalitici per la sintesi di vettori energetici”

Assignment: involved Researcher

Funding Institution: Italian Ministry of Instruction, University and Research (MIUR)

Total funding: 1063000 €

Unit Funding: 348400 €

PI: Dr. Erik Vesselli

Unit Chief: Dr. Manuela Bevilacqua

8. Name: “Research and development of solutions for the on board H₂ generation of sodium borohydride (NaBH₄), including the reactor design, proof of concept and prototype”

Assignment: involved Researcher

Funding Institution: Belenos Ltd

Total funding: 125000 €

Unit Funding: 125000 €

PI: Dr. Francesco Vizza

9. Name: “FISR Nanosistemi inorganici e ibridi per lo sviluppo e l’innovazione di celle a combustibile”

Assignment: Grant Holder

Funding Institution: Italian Ministry of Instruction, University and Research (MIUR)

Total funding: 6299693 €

Unit Funding: 480221 €

PI: Dr. Claudio Bianchini

Unit Chief: Dr. Francesco Vizza

10. Name: “EBH2: Elettro-Bio-Idrogeno” Assignment: Grant Holder

Funding Institution: Regione Toscana Total funding: 500000 €

Unit Funding: 363000 €

PI: Dr. Claudio Bianchini

Unit Chief: Dr. Francesco Vizza

MAJOR COLLABORATIONS:

- Prof. Roberto Gobetto, Prof. Carlo Nervi, CO₂ electroreduction and electrocatalysis with organometallic compounds, University of Torino (UniTO) / Department of Chemistry, Italy

- Prof. Massimo Innocenti, Electrochemistry , University of Florence (UniFI) / Department of Chemistry, Italy
- Dr. Carlo Santoro, University of Milano-Bicocca (UniMIB) / Department of Material Science
- Dr. Chiara Ferrara, University of Milano-Bicocca (UniMIB) / Department of Material Science
- Prof. Giovanni Zangari, CO₂ electroreduction, University of Virginia, Department of Material Sciences, Virginia (VA) United states of America
- Prof. Hansjörg Grützmacher, Fuel cell and electrocatalysis with organometallic compounds, ETH Zürich, Switzerland
- Prof. Kenneth Ozoemena, Fuel cell and electrocatalysis, University of the Witwatersrand/School of Chemistry/ South Africa

ORGANIZATION OF SCIENTIFIC MEETINGS:

- 2018 Local Staff of the 28th International Conference on Organometallic Chemistry ICOMC-2018/Florence-Italy
- 2017 Local Staff of the XIII EuropaCat conference/Florence-Italy

REVIEWING ACTIVITIES:

- 2020 current Guest editor for MDPI special issue “Sustainable Processes for hydrogen production and Storage”

PUBLISHED PAPERS:

1) Capozzoli, L., Caprì, A., Baglio, V., Berretti, E., Evangelisti, C., Filippi, J., Gatto, I., Lavacchi, A., Pagliaro, M., Vizza, F.

Ruthenium-loaded titania nanotube arrays as catalysts for the hydrogen evolution reaction in alkaline membrane electrolysis

(2023) Journal of Power Sources, 562, art. no. 232747.

DOI: 10.1016/j.jpowsour.2023.232747

2) Oberhauser, W., Poggini, L., Capozzoli, L., Bellini, M., Filippi, J., Vizza, F.

Oxidation of Ethanol to Acetic Acid by Supported PtCu Nanoparticles Stabilized by a Diamine Ligand

(2023) Inorganic Chemistry, 62 (6), pp. 2848-2858.

DOI: 10.1021/acs.inorgchem.2c04202

3) Vanni, M., Serrano-Ruiz, M., Filippi, J., Salvatici, M.C., Fonda, E., Peruzzini, M., Caporali, M. Unraveling the Role of Nickel Nanoparticles Functionalization in the Electronic Properties and Structural Features of 2D Black Phosphorene Exposed to Ambient Conditions (2023) *ChemPlusChem*, 88 (2), art. no. e202200457.
DOI: 10.1002/cplu.202200457

4) Pagliaro, M.V., Bellini, M., Bartoli, F., Filippi, J., Marchionni, A., Castello, C., Oberhauser, W., Poggini, L., Cortigiani, B., Capozzoli, L., Lavacchi, A., Miller, H.A., Vizza, F. Probing the effect of metal-CeO₂ interactions in carbon supported electrocatalysts on alkaline hydrogen oxidation and evolution reactions (2022) *Inorganica Chimica Acta*, 543, art. no. 121161.
DOI: 10.1016/j.ica.2022.121161

5) Filippi, J., Miller, H.A., Nasi, L., Pagliaro, M.V., Marchionni, A., Melchionna, M., Fornasiero, P., Vizza, F. Optimization of H₂O₂ production in a small-scale off-grid buffer layer flow cell equipped with Cobalt@N-doped graphitic carbon core-shell nanohybrid electrocatalyst (2022) *Materials Today Energy*, 29, art. no. 101092
DOI: 10.1016/j.mtener.2022.101092

6) Zarattini, M., Dun, C., Isherwood, L.H., Felten, A., Filippi, J., Gordon, M.P., Zhang, L., Kassem, O., Song, X., Zhang, W., Ionescu, R., Wittkopf, J.A., Baidak, A., Holder, H., Santoro, C., Lavacchi, A., Urban, J.J., Casiraghi, C. Synthesis of 2D anatase TiO₂ with highly reactive facets by fluorine-free topochemical conversion of 1T-TiS₂ nanosheets (2022) *Journal of Materials Chemistry A*, 10 (26), pp. 13884-13894
DOI: 10.1039/d1ta06695a

7) Muhyuddin, M., Filippi, J., Zoia, L., Bonizzoni, S., Lorenzi, R., Berretti, E., Capozzoli, L., Bellini, M., Ferrara, C., Lavacchi, A., Santoro, C. Waste Face Surgical Mask Transformation into Crude Oil and Nanostructured Electrocatalysts for Fuel Cells and Electrolyzers (2022) *ChemSusChem*, 15 (2), art. no. e202102351, .
DOI: 10.1002/cssc.202102351

8) Filippi, J., Rotundo, L., Gobetto, R., Miller, H.A., Nervi, C., Lavacchi, A., Vizza, F. Turning manganese into gold: Efficient electrochemical CO₂ reduction by a fac-Mn(apbpy)(CO)₃Br complex in a gas-liquid interface flow cell (2021) *Chemical Engineering Journal*, 416, art. no. 129050, .
DOI: 10.1016/j.cej.2021.129050

9) Boukhvalov, D.W., Kuo, C.-N., Nappini, S., Marchionni, A., D'Olimpio, G., Filippi, J., Mauri, S., Torelli, P., Lue, C.S., Vizza, F., Politano, A. Efficient Electrochemical Water Splitting with PdSn₄Dirac Nodal Arc Semimetal (2021) *ACS Catalysis*, 11 (12), pp. 7311-7318.
DOI: 10.1021/acscatal.1c01653

10) Bellini, M., Pagliaro, M.V., Marchionni, A., Filippi, J., Miller, H.A., Bevilacqua, M., Lavacchi, A., Oberhauser, W., Mahmoudian, J., Innocenti, M., Fornasiero, P., Vizza, F.

Hydrogen and chemicals from alcohols through electrochemical reforming by Pd-CeO₂/C electrocatalyst

(2021) *Inorganica Chimica Acta*, 518, art. no. 120245, .

DOI: 10.1016/j.ica.2021.120245

11) Bartolini, M., Gombac, V., Sinicropi, A., Reginato, G., Dessì, A., Mordini, A., Filippi, J., Montini, T., Calamante, M., Fornasiero, P., Zani, L.

Tuning the Properties of Benzothiadiazole Dyes for Efficient Visible Light-Driven Photocatalytic H₂ Production under Different Conditions

(2020) *ACS Applied Energy Materials*, 3 (9), pp. 8912-8928.

DOI: 10.1021/acsaem.0c01391

12) Tuci, G., Filippi, J., Rossin, A., Luconi, L., Pham-Huu, C., Yakhvarov, D., Vizza, F., Giambastiani, G.

CO₂ electrochemical reduction by exohedral N-pyridine decorated metal-free carbon nanotubes

(2020) *Energies*, 13 (11), art. no. 2703, .

DOI: 10.3390/en13112703

13) D'Olimpio, G., Boukhvalov, D.W., Fujii, J., Torelli, P., Marchionni, A., Filippi, J., Kuo, C.-N., Edla, R., Ottaviano, L., Lue, C.S., Vizza, F., Nappini, S., Politano, A.

Catalytic activity of PtSn₄: Insights from surface-science spectroscopies

(2020) *Applied Surface Science*, 514, art. no. 145925.

DOI: 10.1016/j.apsusc.2020.145925

14) Bellini, M., Bevilacqua, M., Marchionni, A., Miller, H.A., Filippi, J., Grützmacher, H., Vizza, F. Energy Production and Storage Promoted by Organometallic Complexes

(2020) *European Journal of Inorganic Chemistry*, .

DOI: 10.1002/ejic.201801149

15) Boukhvalov, D.W., Marchionni, A., Filippi, J., Kuo, C.-N., Fujii, J., Edla, R., Nappini, S., D'Olimpio, G., Ottaviano, L., Lue, C.S., Torelli, P., Vizza, F., Politano, A.

Efficient hydrogen evolution reaction with platinum stannide PtSn₄: Via surface oxidation

(2020) *Journal of Materials Chemistry A*, 8 (5), pp. 2349-2355.

DOI: 10.1039/c9ta10097k

16) Bettucci, O., Skaltsas, T., Calamante, M., Dessì, A., Bartolini, M., Sinicropi, A., Filippi, J., Reginato, G., Mordini, A., Fornasiero, P., Zani, L.

Combining Dithienosilole-Based Organic Dyes with a Brookite/Platinum Photocatalyst toward Enhanced Visible-Light-Driven Hydrogen Production

(2019) *ACS Applied Energy Materials*, 2 (8), pp. 5600-5612.

DOI: 10.1021/acsaem.9b00782

17) Passaponti, M., Rosi, L., Savastano, M., Giurlani, W., Miller, H.A., Lavacchi, A., Filippi, J., Zangari, G., Vizza, F., Innocenti, M.

Recycling of waste automobile tires: Transforming char in oxygen reduction reaction catalysts for alkaline fuel cells

(2019) *Journal of Power Sources*, 427, pp. 85-90.

DOI: 10.1016/j.jpowsour.2019.04.067

18) Bellini, M., Folliero, M.G., Evangelisti, C., He, Q., Hu, Y., Pagliaro, M.V., Oberhauser, W., Marchionni, A., Filippi, J., Miller, H.A., Vizza, F.

A Gold-Palladium Nanoparticle Alloy Catalyst for CO Production from CO₂ Electroreduction

(2019) *Energy Technology*, 7 (4), art. no. 1800859, .
DOI: 10.1002/ente.201800859

19) Rotundo, L., Filippi, J., Gobetto, R., Miller, H.A., Rocca, R., Nervi, C., Vizza, F.
Electrochemical CO₂ reduction in water at carbon cloth electrodes functionalized with a fac-Mn(apbpy)(CO)₃Br complex
(2019) *Chemical Communications*, 55 (6), pp. 775-777.
DOI: 10.1039/c8cc08385a

20) Bellini, M., Bevilacqua, M., Marchionni, A., Miller, H.A., Filippi, J., Grützmacher, H., Vizza, F.
Energy Production and Storage Promoted by Organometallic Complexes
(2018) *European Journal of Inorganic Chemistry*, 2018 (40), pp. 4393-4412.
DOI: 10.1002/ejic.201800829

21) Pagliaro, M.V., Bellini, M., Filippi, J., Folliero, M.G., Marchionni, A., Miller, H.A., Oberhauser, W., Vizza, F.
Hydrogen production from the electrooxidation of methanol and potassium formate in alkaline media on carbon supported Rh and Pd nanoparticles
(2018) *Inorganica Chimica Acta*, 470, pp. 263-269.
DOI: 10.1016/j.ica.2017.05.055

22) Tuci, G., Filippi, J., Ba, H., Rossin, A., Luconi, L., Pham-Huu, C., Vizza, F., Giambastiani, G.
How to teach an old dog new (electrochemical) tricks: Aziridine-functionalized CNTs as efficient electrocatalysts for the selective CO₂ reduction to CO
(2018) *Journal of Materials Chemistry A*, 6 (34), pp. 16382-16389.
DOI: 10.1039/c8ta04267e

23) Chen, Y.X., Gombac, V., Montini, T., Lavacchi, A., Filippi, J., Miller, H.A., Fornasiero, P., Vizza, F.
An increase in hydrogen production from light and ethanol using a dual scale porosity photocatalyst
(2018) *Green Chemistry*, 20 (10), pp. 2299-2307.
DOI: 10.1039/c7gc03508j

24) Bellini, M., Filippi, J., Miller, H.A., Oberhauser, W., Vizza, F., He, Q., Grützmacher, H.
Hydrogen and Chemicals from Renewable Alcohols by Organometallic Electroreforming
(2017) *ChemCatChem*, 9 (5), pp. 746-750.
DOI: 10.1002/cctc.201601427

25) Pagliaro, M.V., Bellini, M., Bevilacqua, M., Filippi, J., Folliero, M.G., Marchionni, A., Miller, H.A., Oberhauser, W., Caporali, S., Innocenti, M., Vizza, F.
Carbon supported Rh nanoparticles for the production of hydrogen and chemicals by the electroreforming of biomass-derived alcohols
(2017) *RSC Advances*, 7 (23), pp. 13971-13978.
DOI: 10.1039/c7ra00044h

26) Miller, H.A., Wang, L., Bellini, M., Filippi, J., Marchionni, A., Folliero, M.G., Lavacchi, A., Pagliaro, M.V., Vizza, F.
Performance Evaluation of a Platinum-Free Microscale Alkaline Direct Ethanol Fuel Cell Operating for Long Periods
(2016) *Energy Technology*, 4 (9), pp. 1119-1124.

DOI: 10.1002/ente.201600143

27) Bevilacqua, M., Filippi, J., Folliero, M., Lavacchi, A., Miller, H.A., Marchionni, A., Vizza, F.
Enhancement of the Efficiency and Selectivity for Carbon Dioxide Electroreduction to Fuels on
Tailored Copper Catalyst Architectures
(2016) *Energy Technology*, 4 (8), pp. 1020-1028.
DOI: 10.1002/ente.201600044

28) Wang, L.Q., Bellini, M., Filippi, J., Folliero, M., Lavacchi, A., Innocenti, M., Marchionni, A.,
Miller, H.A., Vizza, F.
Energy efficiency of platinum-free alkaline direct formate fuel cells
(2016) *Applied Energy*, 175, pp. 479-487.
DOI: 10.1016/j.apenergy.2016.02.129

29) Marchionni, A., Bevilacqua, M., Filippi, J., Folliero, M.G., Innocenti, M., Lavacchi, A., Miller,
H.A., Pagliaro, M.V., Vizza, F.
High volume hydrogen production from the hydrolysis of sodium borohydride using a cobalt
catalyst supported on a honeycomb matrix
(2015) *Journal of Power Sources*, 299, pp. 391-397.
DOI: 10.1016/j.jpowsour.2015.09.006

30) Wang, L., Lavacchi, A., Bevilacqua, M., Bellini, M., Fornasiero, P., Filippi, J., Innocenti, M.,
Marchionni, A., Miller, H.A., Vizza, F.
Energy Efficiency of Alkaline Direct Ethanol Fuel Cells Employing Nanostructured Palladium
Electrocatalysts
(2015) *ChemCatChem*, 7 (14), pp. 2214-2221.
DOI: 10.1002/cctc.201500189

31) Oberhauser, W., Evangelisti, C., Jumde, R.P., Psaro, R., Vizza, F., Bevilacqua, M., Filippi, J.,
Machado, B.F., Serp, P.
Platinum on carbonaceous supports for glycerol hydrogenolysis: Support effect
(2015) *Journal of Catalysis*, 325, pp. 111-117.
DOI: 10.1016/j.jcat.2015.03.003

32) Wang, L.Q., Bevilacqua, M., Filippi, J., Fornasiero, P., Innocenti, M., Lavacchi, A., Marchionni,
A., Miller, H.A., Vizza, F.
Electrochemical growth of platinum nanostructures for enhanced ethanol oxidation
(2015) *Applied Catalysis B: Environmental*, 165, pp. 185-191.
DOI: 10.1016/j.apcatb.2014.10.009

33) Bevilacqua, M., Filippi, J., Miller, H.A., Vizza, F.
Recent technological progress in CO₂ electroreduction to fuels and energy carriers in aqueous
environments
(2015) *Energy Technology*, 3 (3), pp. 197-210.
DOI: 10.1002/ente.201402166

34) Bellini, M., Bevilacqua, M., Filippi, J., Lavacchi, A., Marchionni, A., Miller, H.A., Oberhauser,
W., Vizza, F., Annen, S.P., Grützmacher, H.
Energy and chemicals from the selective electrooxidation of renewable diols by organometallic fuel
cells
(2014) *ChemSusChem*, 7 (9), pp. 2432-2435.
DOI: 10.1002/cssc.201402316

- 35) Chen, Y.X., Lavacchi, A., Miller, H.A., Bevilacqua, M., Filippi, J., Innocenti, M., Marchionni, A., Oberhauser, W., Wang, L., Vizza, F.
Nanotechnology makes biomass electrolysis more energy efficient than water electrolysis
(2014) *Nature Communications*, 5, art. no. 4036, .
DOI: 10.1038/ncomms5036
- 36) Bevilacqua, M., Filippi, J., Lavacchi, A., Marchionni, A., Miller, H.A., Oberhauser, W., Vesselli, E., Vizza, F.
Energy Savings in the Conversion of CO₂ to Fuels using an Electrolytic Device
(2014) *Energy Technology*, 2 (6), pp. 522-525.
DOI: 10.1002/ente.201402014
- 37) Bellini, M., Bevilacqua, M., Innocenti, M., Lavacchi, A., Miller, H.A., Filippi, J., Marchionni, A., Oberhauser, W., Wang, L., Vizza, F.
Energy & chemicals from renewable resources by electrocatalysis
(2014) *Journal of the Electrochemical Society*, 161 (7), pp. D3032-D3043.
DOI: 10.1149/2.005407jes
- 38) Wang, L., Bevilacqua, M., Chen, Y.-X., Filippi, J., Innocenti, M., Lavacchi, A., Marchionni, A., Miller, H., Vizza, F.
Enhanced electro-oxidation of alcohols at electrochemically treated polycrystalline palladium surface
(2013) *Journal of Power Sources*, 242, pp. 872-876.
DOI: 10.1016/j.jpowsour.2013.06.068
- 39) Miller, H.A., Bevilacqua, M., Filippi, J., Lavacchi, A., Marchionni, A., Marelli, M., Moneti, S., Oberhauser, W., Vesselli, E., Innocenti, M., Vizza, F.
Nanostructured Fe-Ag electrocatalysts for the oxygen reduction reaction in alkaline media
(2013) *Journal of Materials Chemistry A*, 1 (42), pp. 13337-13347.
DOI: 10.1039/c3ta12757e
- 40) Marchionni, A., Bevilacqua, M., Bianchini, C., Chen, Y.-X., Filippi, J., Fornasiero, P., Lavacchi, A., Miller, H., Wang, L., Vizza, F.
Electrooxidation of ethylene glycol and glycerol on Pd-(Ni-Zn)/C anodes in direct alcohol fuel cells
(2013) *ChemSusChem*, 6 (3), pp. 518-528.
DOI: 10.1002/cssc.201200866
- 41) Bevilacqua, M., Bianchini, C., Marchionni, A., Filippi, J., Lavacchi, A., Miller, H., Oberhauser, W., Vizza, F., Granozzi, G., Artiglia, L., Annen, S.P., Krumeich, F., Grützmacher, H.
Improvement in the efficiency of an OrganoMetallic Fuel Cell by tuning the molecular architecture of the anode electrocatalyst and the nature of the carbon support
(2012) *Energy and Environmental Science*, 5 (9), pp. 8608-8620.
DOI: 10.1039/c2ee22055e
- 42) Tuci, G., Vinattieri, C., Luconi, L., Ceppatelli, M., Cicchi, S., Brandi, A., Filippi, J., Melucci, M., Giambastiani, G.
"Click" on tubes: A versatile approach towards multimodal functionalization of SWCNTs
(2012) *Chemistry - A European Journal*, 18 (27), pp. 8454-8463.
DOI: 10.1002/chem.201200650

- 43) Bambagioni, V., Bianchini, C., Chen, Y., Filippi, J., Fornasiero, P., Innocenti, M., Lavacchi, A., Marchionni, A., Oberhauser, W., Vizza, F.
Energy efficiency enhancement of ethanol electrooxidation on Pd-CeO₂/C in passive and active polymer electrolyte-membrane fuel cells
(2012) *ChemSusChem*, 5 (7), pp. 1266-1273.
DOI: 10.1002/cssc.201100738
- 44) Trifonov, A.A., Shestakov, B.G., Gudilenkov, I.D., Fukin, G.K., Giambastiani, G., Bianchini, C., Rossin, A., Luconi, L., Filippi, J., Sorace, L.
Steric control on the redox chemistry of (η⁵-C₉H₇)₂YbII(THF)₂ by 6-aryl substituted iminopyridines
(2011) *Dalton Transactions*, 40 (40), pp. 10568-10575.
DOI: 10.1039/c1dt10135h
- 45) Bettucci, L., Bianchini, C., Filippi, J., Lavacchi, A., Oberhauser, W.
Chemoselective aerobic diol oxidation by palladium(II)-pyridine catalysis
(2011) *European Journal of Inorganic Chemistry*, (11), pp. 1797-1805.
DOI: 10.1002/ejic.201001300
- 46) Bambagioni, V., Bianchini, C., Filippi, J., Lavacchi, A., Oberhauser, W., Marchionni, A., Moneti, S., Vizza, F., Psaro, R., Dal Santo, V., Gallo, A., Recchia, S., Sordelli, L.
Single-site and nanosized Fe-Co electrocatalysts for oxygen reduction: Synthesis, characterization and catalytic performance
(2011) *Journal of Power Sources*, 196 (5), pp. 2519-2529.
DOI: 10.1016/j.jpowsour.2010.11.030
- 47) Annen, S.P., Bambagioni, V., Bevilacqua, M., Filippi, J., Marchionni, A., Oberhauser, W., Schönberg, H., Vizza, F., Bianchini, C., Grützmacher, H.
A biologically inspired organometallic fuel cell (OMFC) that converts renewable alcohols into energy and chemicals
(2010) *Angewandte Chemie - International Edition*, 49 (40), pp. 7229-7233.
DOI: 10.1002/anie.201002234
- 48) Bambagioni, V., Bevilacqua, M., Bianchini, C., Filippi, J., Marchionni, A., Vizza, F., Wang, L.Q., Shen, P.K.
Ethylene glycol electrooxidation on smooth and nanostructured Pd electrodes in alkaline media
(2010) *Fuel Cells*, 10 (4), pp. 582-590.
DOI: 10.1002/fuce.200900120
- 49) Wang, L., Bambagioni, V., Bevilacqua, M., Bianchini, C., Filippi, J., Lavacchi, A., Marchionni, A., Vizza, F., Fang, X., Shen, P.K.
44) Sodium borohydride as an additive to enhance the performance of direct ethanol fuel cells
(2010) *Journal of Power Sources*, 195 (24), pp. 8036-8043.
DOI: 10.1016/j.jpowsour.2010.06.101
- 50) Bambagioni, V., Bevilacqua, M., Bianchini, C., Filippi, J., Lavacchi, A., Marchionni, A., Vizza, F., Shen, P.K.
Self-sustainable production of hydrogen, chemicals, and energy from renewable alcohols by electrocatalysis
(2010) *ChemSusChem*, 3 (7), pp. 851-855.
DOI: 10.1002/cssc.201000103

- 51) Bambagioni, V., Bianchini, C., Marchionni, A., Filippi, J., Vizza, F., Teddy, J., Serp, P., Zhiani, M.
Pd and Pt-Ru anode electrocatalysts supported on multi-walled carbon nanotubes and their use in passive and active direct alcohol fuel cells with an anion-exchange membrane (alcohol = methanol, ethanol, glycerol)
(2009) Journal of Power Sources, 190 (2), pp. 241-251.
DOI: 10.1016/j.jpowsour.2009.01.044
- 52) Bianchini, C., Bambagioni, V., Filippi, J., Marchionni, A., Vizza, F., Bert, P., Tampucci, A.
Selective oxidation of ethanol to acetic acid in highly efficient polymer electrolyte membrane-direct ethanol fuel cells
(2009) Electrochemistry Communications, 11 (5), pp. 1077-1080.
DOI: 10.1016/j.elecom.2009.03.022
- 53) Bambagioni, V., Bianchini, C., Filippi, J., Oberhauser, W., Marchionni, A., Vizza, F., Psaro, R., Sordelli, L., Foresti, M.L., Innocenti, M.
Ethanol oxidation on electrocatalysts obtained by spontaneous deposition of palladium onto nickel-zinc materials
(2009) ChemSusChem, 2 (1), pp. 99-112.
DOI: 10.1002/cssc.200800188

PATENTS:

- 1) Vizza F, Miller H A, Folliero M G, Marchionni A, Filippi J.
"Hydrometallurgic processes for the treatment of lithium batteries and recovery of the metals contained therein."
PCT/IT2019/050013, WO/2019/150403
- 2) Vizza F, Miller H A, Folliero M G, Marchionni A, Filippi J.
"Procedimento idrometallurgico per il trattamento di batterie al litio e recupero dei metalli in esse contenuti."
IT201800002175A1
- 3) Vizza F, Cenci G, Righi E, Sibani F, Marchionni A, Filippi J, Bianchini C, Magnani S
"Apparatus for the production of Gas"
US 2015/0284246 A1; WO 2014/115178 A1; PCT/IT2013/000022
- 4) Cenci G, Righi E, Sibani F, Marchionni A, Filippi J, Vizza F, Bianchini C, Magnani S
"Gas generator, in particular for gaseous hydrogen"
US 2015/0284246 A1; WO 2014/097334 A1; PCT/IT2012/000397
- 5) Vizza F, Cenci G, Filippi J, Bianchini C, Marchionni A
"Device for the generation of hydrogen, apparatuses that contain the device and their use"
WO 2013/021242 A1; PTWO 11254 filling date 16-09-2011
- 6) Vizza F, Bianchini C, Cenci G, Filippi J, Marchionni
"Hydrogen generator, its realization and use"
WO 2013/021243 A1; PTWO 11255 filling date 16-09-2011

SCHOOLS:

1) Attendance to the European Federation of Catalysis Societies (EFCATS) Summer School 2012, 1st Italian-Spanish School on Catalysis "Recent Advances and New Trends in Catalysis", 11-15 september 2012. Poster presentation: "Combined effect of the molecular architecture of the anode electrocatalyst and of the carbon support on the efficiency of an Organometallic Fuel Cell" M. Bevilacqua, A. Marchionni, J. Filippi, A. Lavacchi, W. Oberhauser, F. Vizza, H. Grutmacher, C. Bianchini.

PRESENTATIONS, POSTERS, CONGRESSES (LAST 5 YEARS):

2022:

"Efficient electroreduction of CO₂ to CO and HCOOH in a gas-liquid buffer layer flow cell employing carbon cloth electrodes functionalized with a *fac*-Mn(apbpy)(CO)₃Br complex as gas diffusion cathodes"

Jonathan Filippi, Laura Rotundo, Hamish A. Miller, Riccardo Rocca, Roberto Gobetto, Carlo Nervi, Francesco Vizza

Oral communication the 44th International Conference on Coordination Chemistry, 28 August-2 Sept 2022, Rimini, Italy

2021:

"Efficient electroreduction of CO₂ to CO and HCOOH in a gas-liquid buffer layer flow cell employing carbon cloth electrodes functionalized with a *fac*-Mn(apbpy)(CO)₃Br complex as gas diffusion cathodes"

Jonathan Filippi, Laura Rotundo, Hamish A. Miller, Riccardo Rocca, Roberto Gobetto, Carlo Nervi, Francesco Vizza

Oral communication at the 30th ISE topical Meeting, 21-24 November 2021, Taipei, Taiwan

2020:

"Efficient electrochemical production of carbon monoxide and formic acid from CO₂ in a gas-liquid buffer layer flow cell employing carbon cloth electrodes functionalized with a *fac*-Mn(apbpy)(CO)₃Br complex as gas diffusion cathodes"

Jonathan Filippi, Laura Rotundo, Hamish A. Miller, Riccardo Rocca, Roberto Gobetto, Carlo Nervi, Francesco Vizza.

Poster at 2th ENERCHEM (Italian Chemistry Society) Meeting, 12-14 February 2020; Padova, Italy

2019:

"Production of syngas by electrochemical CO₂ reduction in water at carbon cloth electrodes functionalized with a *fac*-Mn(apbpy)(CO)₃Br complex"

Jonathan Filippi, Laura Rotundo, Hamish A. Miller, Riccardo Rocca, Roberto Gobetto, Carlo Nervi, Francesco Vizza

Poster at 25th ISE Topical Meeting, "New electrochemical processes for energy and the environment" 12-15 May 2019, Toledo, Spain

2018:

"Energy efficient production of hydrocarbons and formate by depolarized-anode CO₂ electroreduction on tailored copper nanostructures" Jonathan Filippi, Manuela Bevilacqua, Marco Bellini, Maria Folliero, Andrea Marchionni, Hamish A. Miller, Maria Pagliaro, Francesco Vizza

Poster at the CIMTEC, 8th forum of the new materials, Perugia (PG) June 10-14, 2018

"A Gold-Palladium Nanoparticle Alloy Catalyst for CO Production from CO₂ Electroreduction"

Jonathan Filippi, Marco Bellini, Claudio Evangelisti, Maria V. Pagliaro, Werner Oberhauser, Andrea Marchionni, Maria G. Folliero, Hamish A. Miller, Francesco Vizza

Poster at the 28th congress ICOMC (International Congress) on Organometallic Chemistry), Florence (FI) July 15-20, 2018

“A Gold-Palladium Nanoparticle Alloy Catalyst for CO Production from CO₂ Electroreduction”

Jonathan Filippi, Marco Bellini, Claudio Evangelisti, Maria V. Pagliaro, Werner Oberhauser, Andrea Marchionni, Maria G. Folliero, Hamish A. Miller, Francesco Vizza

Poster at 69th Annual International Electrochemical Society Congress, Bologna (BO), September, 2-7, 2018

2017:

1) “Carbon supported Rh nanoparticles for hydrogen and chemicals production from electrochemical reforming of biomass derived alcohols”

M. V. Pagliaro, M. Bellini, M. Bevilacqua, J. Filippi, M. Folliero A. Marchionni, H.A. Miller, W. Oberhauser, S. Caporali, M. Innocenti, F. Vizza.

Poster, Europacat 2017, August 27-31, 2017, Firenze (FI), Italy

2) “Energy efficient production of hydrocarbons and formate by depolarized-anode CO₂ electroreduction on tailored copper nanostructures”

J. Filippi, M. Bevilacqua, M. Bellini, M. Folliero, A. Marchionni, H. A. Millera, M. Pagliaro, F. Vizza.

Poster, XXVI Congresso della Società Chimica Italiana, September 11-15, 2017, Paestum (SA), Italy

3) “Hydrogen and chemicals from renewable alcohols by Organometallic Electro-Reforming (OMER)”

M. Bellini, M. V. Pagliaro, H. A. Miller, W. Oberhauser, M. G. Folliero, A. Marchionni, J. Filippi, F. Vizza, H. Grützmacher.

Oral, XXVI Congresso della Società Chimica Italiana, September 11-15, 2017, Paestum (SA), Italy

4) “Hydrogen production from biomass with Rh/C and Pd/C electrocatalysts”

M. V. Pagliaro, M. Bellini, M. Bevilacqua, J. Filippi, M. G. Folliero, A. Marchionni, H. A. Miller, W. Oberhauser, S. Caporali, M. Innocentia, F. Vizza.

Poster, CEN 2017, 7-9 June 2017, Faenza (RA), Italy

EXPERIMENTAL TECHNIQUES KNOWN/USED:

High performanc liquid cromatografy (HPLC), ionic cromatography, gaschromatography with flame ionization (FID) and mass (MS) detectors, FT-IR spectroscopy, ICP-MS and ICP-OAS spectrometry, atomic adsorption spectroscopy (with graphite furnace). Electrochemistry: direct potentiometry, cyclic voltammetry, linear sweep voltammetry, cronopotentiometry, fuel cell polarization curves, fuel cell power curves, tafel plots, electrochemical impedance spectroscopy, Levich plots, FT-IR in-situ spectroscopy.

PERSONAL SKILLS:

SOFTWARE:

Office e OpenOffice software suite, Windows e Linux. Software programming with Python, Fortran77, Basic e C++. Use of MatLab, Mathematica e Statistica 7, Origin, Kaleydagraph, ChemOffice. Photo and video editing, grading, stabilizing with Photoshop, DaVinci Suite

OTHER:

Analog, digital and power electronics, design and construction of printed circuit boards, use of the related hardware, instruments (tester, oscilloscopes) and related softwares, microcontroller

programming, construction of DC-DC switching power converters design for fuel cells and other applications. Knowledge in the testing of solar cells and DC-DC MPPT converters and general knowledge in the renewable energy field. UAS (Unmanned Aerial Systems) piloting and maintenance, and construction, basic FAA and TRUST air security skill test, A1-A3 and A2 UAS EASA training for UAS-OPEN category scenarios.