



CURRICULUM VITAE Dr. VALENTINA CROCELLÀ

PERSONAL INFORMATION

Family name, First name Crocellà, Valentina (VC)
Nationality Italian
Date of Birth 16 Septemeber 1979
Affiliation Chemistry Department
NIS and INSTM reference centre
Università di Torino
Via G. Quarello 15, I-10135 e Via P. Giuria 7, I-10125 Torino, Italia
Researcher Unique Identifiers ORCID ID: 0000-0002-3606-8424
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EDUCATION

01/01/2008 - 31/12/2011 **PhD in Chemical Science**
Disputation date: 04/02/2012
Department of Chemistry, University of Turin, Italy
Supervisor: Prof. C. Morterra
Thesis Title: "Pure and mixed oxidic systems as catalysts for fine chemical applications. Physico-chemical properties and reactivity".
11/07/2007 **MSc in Industrial Chemistry** (110/110 summa cum laude and honors)
University of Turin
Supervisor: Prof. G. Cerrato
Thesis Title: "Study of acetone adsorption on oxidic systems"
30/04/2004 **BCs in Industrial Chemistry**
University of Turin
Final score: 109/110

PROFESSIONAL EXPERIENCES

2019-today **Assistant Professor** (RTD-A/RTD-B) – **SSD CHIM-02**
Department of Chemistry, Università di Torino
2012-2019 **Postdoc Researcher**
Dipartimento di Chimica – Università di Torino



- 2018-2019 **Adjunct Professor**
“Elements of Chemistry and Biochemistry” module
BSc Degree in Science of Sport Activities
University of Turin, Italy
- 2018-2019 **National Scientific Qualification as Associate Professor in the following sectors:**
- 03/A2 – Models and methodologies for Chemical Sciences (CHIM/02)
 - 03/B1 – Fundamentals of Chemical Sciences and Inorganic Systems (CHIM/03)
 - 03/B2 – Chemical Fundamentals of Technologies (CHIM/07)
 - 03/C2 – Industrial Chemistry (CHIM/04)

RESEARCH INTEREST

The scientific activity of VC is devoted to the study of the physico-chemical properties, the catalytic activity and the adsorption capacity of nanostructured materials with high surface area used as heterogeneous catalysts, photo-catalysts, materials for adsorption, separation and storage, among which oxides, zeolites and Metal Organic Frameworks (MOFs). Her studies are mainly related to the advanced characterization of these materials, with a particular attention to their surface properties, through vibrational and electronic spectroscopies (IR, Raman and UV-Vis-NIR) and through volumetric and microcalorimetric techniques. The goal of the research activity is to identify and deeply characterize the active sites of the selected materials by means of “in situ” and “operando” approaches, to detect and monitor them under working conditions.

Carbon dioxide capture, utilization, and storage represents one of her main research subjects.

She is in charge of the microcalorimetry and volumetry laboratory of Department of Chemistry at University of Torino. In this laboratory, she developed new experimental setups for adsorption/desorption measurements which allow performing serial and automated adsorption experiments in a wide range of temperatures with extremely high stability (she is the main author of a patent).

Recently VC started to develop a new research line focused on the design and synthesis of new innovative porous materials (such as ordered mesoporous materials and hierarchical zeolites).

PARTICIPATION TO RESEARCH PROJECTS (Projects in progress)

- 2023-2026 Project "Double-Active Membranes for a sustainable CO₂ cycle" (DAM4CO₂), HORIZON-EIC-2022-PATHFINDERCHALLENGES-01 - EIC Pathfinder Challenge: Carbon dioxide and Nitrogen management and valorisation. **Role: PI for INSTM unit.** INSTM budget: 1.077.750 €.



2022-2025	Project “Per-fluorinated metal-Organic frameworks-based Mixed matrix membranes for large-scale carbon dioxide separation. (doMino)”, PRIN 2020 – Role: PI for UniTO unit. UniTO budget: 103.122 €
2019-2023	Project “Scarti organici e Anidride carbonica Trasformati in carburanti, fertilizzanti e prodotti chimici; applicazione concreta dell’economia circolare. (SATURNO)”. Role: local PI and task Leader. UniTO budget: 71.000 €.
2020-2023	Research Project “Chimica Fisica delle Superfici e delle Interfacce”, Local research of University of Torino 2020. Role: PI. Budget: 45.000 €.
2020-2026	Project “Copper Based catalysts for selective C-H activation” (CUBE), ERC Synergy. Role: Participant; PI (UniTO unit): Prof. S. Bordiga (budget UniTO unit: 2 100 000 €).
2021-2024	Project "Air Carbon Recycling for Aviation Fuel Technology (4AirCRAFT). H2020-LC-SC3-2020-NZE-RES-CC. Role: Participant. PI (UniTO unit): prof. F. Bonino. (budget UniTO unit: 200.000 €).
2021-2025	Project “Cu-CHA zeolite-based catalysts for the selective catalytic reduction of NOx in exhaust diesel gas: addressing the issue of Sulfur Stability” (CHASS). H2020-MSCA-ITN-2020 – Role: Participant. PI (UniTO unit): prof. G. Berlier

SCIENTIFIC PUBLICATIONS (updated to June 2023)

VC is author of **54 scientific publications: 50 Journal articles (ISI WoS), 1 Perspective Article (ISI WoS), 2 book chapters, e 1 Elettra Highlight.** VC scientific publications received more than **2400** citations, with a **h-index** of **20**.

List of 10 selected publications:

1. Finelli V., Gentilin V., Mossotti, G., Ricchiardi G., Piovano A., Crocella' V., Groppo, E (2023). The role of porosity and acidity in the catalytic upcycling of polyethylene. **CATALYSIS TODAY**, vol. 419, p. 114142-114152, ISSN: 0920-5861, doi: 10.1016/j.cattod.2023.114142.
2. Cavallo M., Dosa M., Porcaro NG., Bonino F., Piumetti M., Crocellà V. (2023). Shaped natural and synthetic zeolites for CO2 capture in a wide temperature range. **JOURNAL OF CO2 UTILIZATION**, vol. 67, p. 102335-102347, ISSN: 2212-9820, doi: 10.1016/j.jcou.2022.102335.
3. Morelli Venturi D., Guiotto V., D'Amato R., Calucci L., Signorile M., Taddie M., Crocella' V., Costantino F. (2023). Solvent-free synthesis of a new perfluorinated MIL-53(Al) with a temperature-induced breathing effect. **MOLECULAR SYSTEMS DESIGN & ENGINEERING**, vol. 8, p. 586-590, ISSN: 2058-9689, doi:10.1039/d2me00280a.
4. Cavallo M., Atzori C., Signorile M., Costantino F., Morelli Venturi D., Koutsianos A., Lomachenko K., Calucci L., Martini F., Giovanelli A., Geppi M., Crocellà V., Taddei M.(2023). Cooperative CO2 adsorption mechanism in a perfluorinated CeIV-based metal organic framework. **JOURNAL OF MATERIALS CHEMISTRY. A**, vol. 11, p. 5568-5583, ISSN: 2050-7488, doi:10.1039/d2ta09746j.



5. Airi A., Signorile M., Bonino F., Quagliotto P., Bordiga S., Martens J. A., Crocellà V. (2021). Insights on a Hierarchical MFI Zeolite: A Combined Spectroscopic and Catalytic Approach for Exploring the Multilevel Porous System down to the Active Sites. **ACS APPLIED MATERIALS & INTERFACES**, vol. 13, p. 49114-49127, ISSN: 1944-8244, doi: 10.1021/acsami.1c11614.
6. Schneider C., Mendt M., Poppl A., Crocellà V., Fischer R. A. (2020). Scrutinizing the Pore Chemistry and the Importance of Cu(I) Defects in TCNQLoaded Cu₃(BTC)₂ by a Multitechnique Spectroscopic Approach. **ACS APPLIED MATERIALS & INTERFACES**, vol. 12, p. 1024-1035, ISSN: 1944-8244, doi: 10.1021/acsami.9b16663.
7. Grahn M., Abrar F., Öhrman O. G., Zhou M., Signorile M., Crocellà V., Nabavi M., Hedlund J. (2020). Small ZSM-5 crystals with low defect density as an effective catalyst for conversion of methanol to hydrocarbons. **CATALYSIS TODAY**, vol. 345, p. 136-146, ISSN: 0920-5861, doi: 10.1016/j.cattod.2019.09.023.
8. Reed, D. A., Keitz B. K., Oktawiec J., Mason J. A., Runcevski T., Xiao D. J., Darago L. E., Crocellà V., Bordiga S., Long J. R. (2017). A spin transition mechanism for cooperative adsorption in metal-organic frameworks. **NATURE**, vol. 550, p. 96-100, ISSN: 0028-0836, doi: 10.1038/nature23674.
9. Crocellà V., Tabanelli T., Vitillo J. G., Costenaro D., Bisio C., Cavani F., Bordiga S. (2017). A multi-technique approach to disclose the reaction mechanism of dimethyl carbonate synthesis over amino-modified SBA-15 catalysts. **APPLIED CATALYSIS. B, ENVIRONMENTAL**, vol. 211, p. 323-336, ISSN: 0926-3373, doi:10.1016/j.apcatb.2017.04.013.
10. McDonald T. M., Mason J. A., Kong X., Bloch E. D., Gygi D., Dani A., Crocellà V., Giordanino, F., Odoh S. O., Drisdell W. S., Vlaisavljevich B. [...] Bordiga S., Reimer J. A., Long J. R. (2015). Cooperative insertion of CO₂ in diamine-appended metal-organic frameworks. **NATURE**, vol. 519, p. 303-308, ISSN: 0028-0836, doi: 10.1038/nature14327.

PATENT

2020 – V. Crocellà et al “Kit for volumetric measurements of gas adsorption”, n. 10202000005014 filed on 9/3/2020 and granted on 29/3/2022.

INVITED TALKS AND SEMINARS

VC actively participates to national and international congresses on chemistry, catalysis, surface science and materials science. VC is **co-author of more than 100 contributions, presented herself 18 oral contributions (5 invited), and 10 poster contributions.**



TEACHING ACTIVITIES

Since A.A. 2018/19 VC has been teaching at both Bachelor and Master levels.

<i>2022-today</i>	Course: “Advanced spectroscopy and nanomaterials” (SSD: Chim/02), M.Sc. Degree in Biotechnological and Chemical Science in Diagnostics, University of Turin (language: English) – AA: 2022-2023 – (2 CFU – 22 h)
<i>2021-today</i>	Course: “Surface phenomena at the micro and nanoscale” (SSD: Chim/02), M.Sc. Degree in Materials Science, University of Turin (language: English) – AA: 2021-2022; 2022-2023 - (3 CFU – 48 h)
<i>2019-2021</i>	Course: “Physical-Chemistry”, M.Sc. Degree in Materials Science (SSD: Chim/02), University of Turin (language: English) – AA: 2019-2020; 2020-2021 - (2.5 CFU – 40 h)
<i>2018-today</i>	Course: “Elements of Biological Chemistry”, B.Cs Degree in Degree in Sciences of motor and sports activities (SSD: Chim/02), University of Turin (language: Italian) – AA: 2018-2019; 2019-2020; 2020-2021; 2021-2022; 2022-2023 - (3 CFU – 24 h)

SUPERVISION OF MASTER STUDENTS, PHD STUDENTS AND RESEARCH FELLOWSHIP

From 2019 VC has been supervisor for:

- **2 PhD students**, PhD Course in Chemistry and Materials Science, University of Turin.
- **6 Master Students**, master’s degree in Materials Science, Chemistry and Industrial Chemistry University of Turin, Italy.
- **5 Research Fellowship**, Chemistry Department, University of Turin.

From 2012 VC has been co-supervisor for:

- 2 PhD students, PhD Course in Chemistry and Materials Science, University of Turin.
- 10 Master Students, master’s degree in Materials Science, Chemistry and Industrial Chemistry University of Turin, Italy.