

Curriculum Vitae Prof. Claudio FONTANESI

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Studies

Claudio Fontanesi (b. 22 march 1958) received the *degree in Chemistry, magna cum laude* (i.e. 110/110 e Lode), at the Dept. of Chemistry, Univ. of Modena, 15 December 1982. Thesis titled: “Theoretical study in the 1,3-Dipolar cycloaddition regioisomery”, supervisor Prof. Augusto Rastelli.

PhD in Physics, University of Bath, 5 October 2017, “An ab-initio theoretical description of vibrational, and electronic states, in pristine and doped organic semiconductors.” supervisor Dr. Enrico Da Como

Academic Career

Assistant Professor of Physical Chemistry, SSD 81, UniMORE from the 01 May 1987.

Associate Professor of Physical Chemistry, CHIM/02, UniMORE from the 01 Nov 2001.

Full Professor, habilitation, “Settore Concorsuale 03/A2 - I Fascia – Quarto Quadrimestre”, Physical Chemistry, 12 July 2020

Research Activity

Prof. Claudio Fontanesi research activity focuses on Physical and Molecular Electrochemistry. From a very general point of view the ultimate goal is to clarify, at a molecular level, the experimental evidence concerning the physical chemical properties of interfaces involved in electrochemical and charge transmission processes:

- 1) electronic properties and redox potentials relationship.
- 2) dynamical properties.

Interfacial Physical Chemistry: thermodynamics, kinetics and structure of the metal/solution interface, adsorption of organics (double layer capacitive measurements, adsorption isotherm fitting, 2D phase transition), Cr electrodeposition mechanism and dynamics. *Electron Transfer*: energy involved in the reduction of organics and study of the dissociative reaction path of organics. The latter based on the use of electrochemical techniques voltammetry in c.c. (linear, cyclic, chrono-methods), as well as by using Electrochemical Impedance Spectroscopy measurements. Experimental results are assessed on the basis of calculated potential energy surfaces, MD trajectories (DFT based, MPn, CI, MCSCF, DRC).

- 3) Spin Dependent Electrochemistry: spin filtering in electron transfer through chiral interfaces.

Bibliometric data SCOPUS: 115 documents, 2055 citations, h-index 24

Recent publications

- [1] D. Mishra, T.Z. Markus, R. Naaman, M. Kettner, B. Gohler, H. Zacharias, N. Friedman, M. Sheves, C. Fontanesi, Spin-dependent electron transmission through bacteriorhodopsin embedded in purple membrane, **PNAS** 110 (2013) 14872–14876.
- [2] Suryakant Mishra, Vishvendra S. Poonia, Claudio Fontanesi, Ron Naaman*, Aaron M. Fleming, and Cynthia J. Burrows, Effect of Oxidative Damage on Charge and Spin Transport in DNA, **J. Am. Chem. Soc.** (2019), 141, 1, 123–126
- [3] P.C. Mondal, N. Kantor-Uriel, S.P. Mathew, F. Tassinari, C. Fontanesi, R. Naaman, Chiral Conductive Polymers as Spin Filters, **Adv. Mat.** 27 (2015) 1924–1927.
- [4] P.C. Mondal, C. Fontanesi, D.H. Waldeck, R. Naaman, Spin-Dependent Transport through Chiral Molecules Studied by Spin-Dependent Electrochemistry, **Acc. Chem. Res.** (2016).
- [5] D. Di Nuzzo, C. Fontanesi, R. Jones, S. Allard, I. Dumsch, U. Scherf, E. von Hauff, S. Schumacher, E. Da Como, How intermolecular geometrical disorder affects the molecular doping of donor–acceptor copolymers, **Nat. Commun.** 6 (2015).
- [6] J. Potticary, L.R. Terry, C. Bell, A.N. Papanikolopoulos, P.C.M. Christianen, H. Engelkamp, A.M. Collins, C. Fontanesi, G. Kociok-Köhn, S. Crampin, E. Da Como, S.R. Hall, An unforeseen polymorph of coronene by the application of magnetic fields during crystal growth, **Nat. Commun.** 7 (2016) 11555.
- [7] A. Kumar, E. Capua, K. Vankayala, C. Fontanesi, R. Naaman, Magnetless Device for Conducting Three-Dimensional Spin-Specific Electrochemistry, **Angew. Chem. Int. Ed.** 56 (2017) 14587–14590.
- [8] C. Fontanesi, et al., **Phys. Rev. Materials** 2017, 1, 055604.
- [9] C. Fontanesi et al., **Small Methods** 2020, 4, 2070038.
- [10] S. Mishra, L. Pasquali, C. Fontanesi, **Appl. Phys. Lett.** 2021, 118, 224001.
- [11] C. Fontanesi, et al. Spin Multiplicity and Solid-State Electrochemical Behavior in Charge-Transfer Co-crystals of DBTTF/F4TCNQ, **J. Phys. Chem. C**, 2021, 125, 16, 8677–8683
- [12] C. Fontanesi, Spin-dependent electrochemistry: A novel paradigm, **Curr. Opin. Electrochem.** 7 (2018) 36–41.

Long period Visiting Scientist:

Weizmann Institute of Science, Dept. of Chemical Physics, c/o Prof. Ron Naaman (2013-2022) for a total of more than 24 months.

Awarded of the “Joseph Meyerhoff Visiting Professorships” 2019/2020, *Weizmann Institute of Science*.

Editor activity:

- 1) Advances in Physical Chemistry, Hindawi: <http://www.hindawi.com/journals/apc/editors/>
- 2) Guest editor: [Journal of Electroanalytical Chemistry Volume 710](#), 1 December 2013
- 3) Editor of Molecules, electrochemistry section.

Patents

1) “Water splitting method and system”

R Naaman, C Fontanesi, W Mtangi

US Patent App. 15/517,738

2) “SOSTANZA CHIRALE, DISPOSITIVO CHIRALE OPERANTE MEDIANTE UNA TALE SOSTANZA E USI DI UN TALE DISPOSITIVO”, Claudio Fontanesi, Mirko Gazzotti.

Domanda numero: 102018000006874

Data di presentazione: 03/07/2018

3) “A SYSTEM AND METHOD FOR PROMOTING CHEMICAL REACTIONS”, Pub . No .: US 2021/0379557 A1, Ron Naaman, Claudio Fontanesi et al.