Matteo Busato
Curriculum Vitae

Part I – General Information

Full Name	Matteo Busato
Spoken Languages	Italian, English (IELTS C1 certification 18/02/2017), French

Part II – Education

Type	Year	Institution	Notes (Degree, Experience,…)
University graduation	2013	University Ca' Foscari of Venice	Bachelor's Degree in Chemistry, 108/110
University graduation	2015	University Ca' Foscari of Venice	Master's Degree in Chemistry, 110/110 *cum laude*
PhD	2020	University of Udine	PhD in Environmental and Energy Engineering Science

Part III – Appointments

IIIA – Academic Appointments

Start	End	Institution	Position
01/05/2020	30/04/2021	Sapienza University of Rome	Post-doctoral fellow
01/05/2021	31/03/2022	Sapienza University of Rome	Post-doctoral fellow
01/04/2022	24/12/2022	Sapienza University of Rome	Post-doctoral fellow

Part IV – Teaching experience

Year	Institution	Lecture/Course
2018	University of Udine	Teaching assistance for the course "Fondamenti di chimica per le tecnologie" (25 h)
2021	University of Udine – Scuola Superiore	Seminars for the course "Simulazioni molecolari" (4h)

Part V - Society memberberships, Awards and Honors

Year	Title
2019	Best oral presentation award at VIII National Workshop of the "Associazione Italiana Chimica per Ingegneria" (AICIng)
2020	AICIng Best PhD Thesis Award
2021	"Società Italiana Luce di Sincrotrone" (SILS) Young Scientist Award

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

Year	Title	Program	Grant value
2020	Ag(I) ion coordination in room temperature ionic liquids (RTILs)	Progetti per Avvio alla Ricerca - Tipo 2 – Sapienza University of Rome	2300 EUR
2021	Structural characterization of metal-based deep eutectic solvents (MDESs)	Progetti per Avvio alla Ricerca - Tipo 2 – Sapienza University of Rome	2000 EUR
2022	Structural Characterization of Titanium Oxide Electrodes after Ca^{2+} Intercalation	Progetti per Avvio alla Ricerca - Tipo 2 – Sapienza University of Rome	2400 EUR
2017	Structural and thermodynamic properties of transition metal ion and complexes in ionic liquids	CINECA Iscra Class C project	68252 core hours
2018	Structural and thermodynamic properties of transition metal ions in Room Temperature Ionic Liquids (RTILs) and mixtures with water	CINECA Iscra Class C project	25000 core hours
2019	Structural and thermodynamic properties of transition metal ions in ionic liquids and mixtures with water	CINECA Iscra Class C project	25000 core hours
2019	Structural and thermodynamic properties of transition metal ions in Room Temperature Ionic Liquids (RTILs)	CINECA Iscra Class C project	10000 core hours
2020	Structural and thermodynamic properties of the Ag(I) ion in ionic liquids	CINECA Iscra Class C project	12500 core hours
2021	Structural properties of metal-based deep eutectic solvents (MDESs)	CINECA Iscra Class C project	32000 core hours
2022	Structural study of cationic surfactants in deep eutectic solvents	CINECA Iscra Class C project	18000 core hours

Part VII – Research Activities

Keywords	Brief Description
X-ray absorption spectroscopy	X-ray absorption spectroscopy (XAS) experiments: sample preparation (liquid and solid samples, solid/liquid interphases), data collection at synchrotron radiation large-scale facilities, data analysis with State-of-the-Art methods and programs (GNXAS, FEFF, MXAN, FDMNES, PyFitit).
Molecular simulations	Simulation of crystal systems, soft matter, solid/liquid interphases, with ground-state quantum chemistry and molecular dynamics (MD) methods both at classical and *ab initio* level of theory (programs: Gaussian, Orca,

	QuantumESPRESSO, CPMD, CP2K, DFTB+, Gromacs)
Ionic liquids, deep eutectic solvents, interphases	Study of the structural properties of both alternative and conventional solvents and their interphases with crystal systems by means of a combined approach between spectroscopic experimental methods (XAS, Raman/IR, UV-Vis, X-ray scattering) and molecular simulations (MD, Density Functional Theory). Study of metal ions solvation.

Part VIII – Summary of Scientific Achievements

Product type	Number	Data Base	Start	End
Papers [international]	21	Scopus	2018	2022
Papers [national]				
Books [scientific]				
Books [teaching]				

Total Impact factor	115.577 (Scopus)
Total Citations	119 (Scopus)
Average Citations per Product	5.7 (Scopus)
Hirsch (H) index	7 (Scopus)
Normalized H index*	1.4 (Scopus)

*****H index divided by the academic seniority.

Part IX– Selected Publications

1) P. D'Angelo*, V. Migliorati*, A. Gibiino, and M. Busato, "Direct Observation of Contact Ion-Pair Formation in La^{3+} Methanol Solution", *Inorg. Chem*. 2022, 61, 17313−17321, doi: 10.1021/acs.inorgchem.2c02932, IF: 5.436, citations: 0.

2) V. Migliorati*, M. Busato, and P. D'Angelo*, "Solvation structure of the $Hg(NO_3)_2$ and $Hg(TfO)_2$ salts in dilute aqueous and methanol solutions: An insight into the Hg^{2+} coordination chemistry", *J. Mol. Liq*. 2022, 363, 119801, doi: 10.1016/j.molliq.2022.119801, IF: 6.633, citations: 0.

3) F. Tavani*, M. Busato, L. Braglia, S. Mauri, P. Torelli, and P. D'Angelo*, "Caught while Dissolving: Revealing the Interfacial Solvation of the Mg^{2+} Ions on the MgO Surface", *ACS Appl. Mater. Interfaces* 2022, 14, 38370−38378, doi: 10.1021/acsami.2c10005, IF: 10.383, citations: 0.

4) P. L. Zanonato*, P. Di Bernardo, A. Melchior, M. Tolazzi, P. Polese, and M. Busato*, "Solvent and Structural effects on Silver(I) Complex Formation: Thermodynamics and Modeling", *J. Therm. Anal. Calorim.* 2022, 147, 5501-5509, doi: 10.1007/s10973-021-11071-z, IF: 4.755, citations: 1.

5) M. Busato*, G. Fazio, F. Tavani, S. Pollastri, and P. D'Angelo*, "Solubilization and coordination of the $HgCl_2$ molecule in water, methanol, acetone, and acetonitrile: an X-ray absorption investigation", *Phys. Chem. Chem. Phys*. 2022, 24, 18094-18102, doi: 10.1039/d2cp02106d, IF: 3.945, citations: 0.

6) M. Busato*, A. Tofoni, G. Mannucci, F. Tavani, A. Del Giudice, A. Colella, M. Giustini, and P. D'Angelo*, "On the Role of Water in the Formation of a Deep Eutectic Solvent Based on $NiCl_2{\cdot}6H_2O$ and Urea", *Inorg. Chem*. 2022, 61, 8843−8853, doi: 10.1021/acs.inorgchem.2c00864, IF: 5.436, citations: 0.

7) M. Busato*, G. Mannucci, V. Di Lisio, A. Martinelli, A. Del Giudice, A. Tofoni, C. Dal Bosco, V. Migliorati, A. Gentili, and P. D'Angelo*, "Structural Study of a Eutectic Solvent Reveals Hydrophobic Segregation and Lack of Hydrogen Bonding between the Components", *ACS Sustain. Chem. Eng*. 2022, 10, 6337-6345, doi: 10.1021/acssuschemeng.2c00920, IF: 9.224, citations: 2.

8) D. Del Giudice, F. Tavani, M. Di Berto Mancini, F. Frateloreto, M. Busato, D. Oliveira De Souza, F. Cenesi, O. Lanzalunga*, S. Di Stefano*, and P. D'Angelo*, "Two Faces of the Same Coin: Coupling X-Ray Absorption and NMR Spectroscopies to Investigate the Exchange Reaction Between Prototypical Cu Coordination Complexes", *Chem. Eur. J*. 2021, 27, 1-8, doi: 10.1002/chem.202103825, IF: 5.020, citations: 2.

9) M. Busato, A. Del Giudice, V. Di Lisio, P. Tomai, V. Migliorati, A. Gentili, A. Martinelli, and P. D'Angelo*, "Fate of a Deep Eutectic Solvent upon Cosolvent Addition: Choline Chloride–Sesamol 1:3 Mixtures with Methanol", *ACS Sustain. Chem. Eng*. 2021, 9, 12252–12261, doi: 10.1021/acssuschemeng.1c03809, IF: 9.224, citations: 2.

10) V. Migliorati*, A. Gibiino, A. Lapi, M. Busato, and P. D'Angelo, "On the Coordination Chemistry of the lanthanum(III) Nitrate Salt in EAN/MeOH Mixtures", *Inorg. Chem*. 2021, 60, 10674–10685, doi: 10.1021/acs.inorgchem.1c01375, IF: 5.436, citations: 3.

11) M. Busato, A. Lapi, P. D'Angelo*, and A. Melchior*, "Coordination of the Co^{2+} and Ni^{2+} Ions in Tf_2N^- Based Ionic Liquids: a Combined X-ray Absorption and Molecular Dynamics Study", *J. Phys. Chem. B* 2021, 125, 6639-6648, doi: 10.1021/acs.jpcb.1c03395, IF: 3.466, citations: 4.

12) M. Busato*, V. Migliorati, A. Del Giudice, V. Di Lisio, P. Tomai, A. Gentili and P. D'Angelo*, "Anatomy of a Deep Eutectic Solvent: Structural Properties of Choline Chloride:Sesamol 1:3 compared to Reline", *Phys. Chem. Chem. Phys*. 2021, 23, 11746-11754, doi: 10.1039/d1cp01105g, IF: 3.945, citations: 8.

13) M. Busato, V. Di Lisio, A. Del Giudice, P. Tomai, V. Migliorati, L. Galantini, A. Gentili, A. Martinelli and P. D'Angelo*, "Transition from molecular- to nano-scale segregation in a deep eutectic solvent - water mixture", *J. Mol. Liq*. 2021, 331, 115747, doi: 10.1016/j.molliq.2021.115747, IF: 6.633, citations: 12.

14) M. Busato, A. Melchior, V. Migliorati, A. Colella, I. Persson, G. Mancini, D. Veclani and P. D'Angelo*, "Elusive Coordination of the Ag^+ Ion in Aqueous Solution: Evidence for a Linear Structure", *Inorg. Chem*. 2020, 59, 17291–17302, doi: 10.1021/acs.inorgchem.0c02494, IF: 5.165, citations: 15.

15) M. Busato, P. D'Angelo, A. Lapi, M. Tolazzi and A. Melchior*, "Solvation of Co^{2+} ion in 1-butyl-3-methylimidazolium bis(trifluoromethylsulfonyl)imide ionic liquid: a molecular dynamics and X-ray absorption study", *J. Mol. Liq*. 2020, 299, 112120, doi: 10.1016/j.molliq.2019.112120, IF: 6.165, citations: 14.

16) M. Busato, P. D'Angelo and A. Melchior*, "Solvation of Zn^{2+} ion in 1-alkyl-3-methylimidazolium bis(trifluoromethylsulfonyl)imide ionic liquids: a molecular dynamics and X-Ray Absorption study", *Phys. Chem. Chem. Phys*. 2019, 21, 6958-6969, doi: 10.1039/c8cp07773h, IF: 3.430, citations: 16.

Part X– Participation as speaker at congresses

1) Oral: M. Busato, M. Tolazzi, and A. Melchior, "Structural and Thermodynamics Properties of Transition Metal Ions in Room Temperature Ionic Liquids", VII Workshop Nazionale AICIng – Politecnico di Milano, Milan, Italy 12 – 13 June 2017.

2) Flash presentation: M. Busato, M. Tolazzi, and A. Melchior, "Structural and Thermodynamic Properties of Transition Metal Ions in Room Temperature Ionic Liquids", Faraday discussion: "Ionic liquids: from fundamental properties to practical applications" – Royal Society of Chemistry, Murray Edwards College, Cambridge, UK, 11 – 13 September 2017.

3) Oral: M. Busato, P. D'Angelo, M. Tolazzi, and A. Melchior, "Structural and Thermodynamic features of the Zn(II) Ion in Room Temperature Ionic Liquids", "I giovani e la chimica in FVG" – Società Chimica Italiana Sezione FVG, Università di Udine, Udine, Italy 9 November 2018.

4) Seminar as invited speaker: M. Busato, "A combined approach between molecular dynamics (MD) simulations and X-ray absorption spectroscopy (XAS) for the study of metal ions in water and ionic liquids", ALBA Synchrotron Light Source, Cerdanyola del Vallès, Spain, 12 November 2018.

5) Oral: M. Busato, P. D'Angelo, M. Tolazzi and A. Melchior, "Structural and Thermodynamic Properties of the Zn^{2+} and Co^{2+} Ions in Room Temperature Ionic Liquids", VIII Workshop Nazionale AICIng – Lipari, Italy, 27 – 29 June 2019 (AICIng best oral presentation Award winner).

6) Flash presentation: M. Busato, A. Colella, G. Mancini, M. Peluso, D. Veclani, A. Melchior, M. Tolazzi, I. Persson, and P. D'Angelo, "Evidence for a linear coordination of Ag^{+} in water: a X-ray absorption spectroscopy, classical and *ab initio* Molecular Dynamics study", QuantumESPRESSO Summer School: "Advanced Materials and Molecular Modelling" – Jožef Stefan Institute, Lubiana, Slovenia, 15 – 20 September 2019.

7) Oral: M. Busato, A. Del Giudice, V. Di Lisio, P. Tomai, V. Migliorati, A. Gentili, A. Martinelli and P. D'Angelo, "Structural characterization of deep eutectic solvents and their mixtures with water and methanol", 18th International Conference on X-Ray Absorption Fine Structure – Sydney, Australia (online), 11 – 13 July 2021.

8) Oral: M. Busato, V. Migliorati, F. Sessa, C. Meneghini, A. Gibiino and P. D'Angelo, "Structural Characterization of Lanthanum(III) Solutions in Ethyl Ammonium Nitrate (EAN) Mixtures with Water and Methanol", Italian Synchrotron Radiation Society (SILS) Annual Meeting 2021 (online), 21 – 23 June 2021.

9) Oral as invited speaker: M. Busato, "Structural and Thermodynamics Properties of Transition Metal Ions in Room Temperature Ionic Liquids", XII Congresso Nazionale AICIng – Reggio Calabria, Italy, 5 – 8 September 2021.

10) Oral: M. Busato, A. Del Giudice, V. Di Lisio, P. Tomai, V. Migliorati, A. Gentili, A. Martinelli, and P. D'Angelo, "Structural Characterization of Deep Eutectic Solvents Mixtures with Water and Methanol", XXVII Congresso Nazionale della Società Chimica Italiana (online), 14 – 23 September 2021.

11) Oral: M. Busato, P. D'Angelo, M. Tolazzi, and A. Melchior, "Transition Metal Ions Coordination and Solvation Thermodynamics in Ionic Liquids", First Symposium for YouNg Chemists: Innovation and Sustainability, Sapienza Università di Roma, Rome, Italy, 20 – 23 June 2022.

12) Oral: M. Busato, G. Mannucci, A. Tofoni, F. Tavani, A. Del Giudice, M. Giustini, and P. D'Angelo, "Structural Aspects of Metal-based Deep Eutectic Solvents and their Mixtures with Water", XLVIII National Congress of Physical Chemistry", Società Chimica Italiana, Genova, Italy, 4 – 7 July 2022.

13) Oral: M. Busato, V. Di Lisio, A. Del Giudice, A. Tofoni, G. Mannucci, F. Tavani, V. Migliorati, A. Martinelli, M. Giustini, A. Gentili, and P. D'Angelo, "A Multidisciplinary Approach to Unveil the Structural Arrangement of Deep Eutectic Solvents: from Local Order to Nano-scale Organization", 4th Joint AIC-SILS Conference – Trieste, Italy, 12 – 15 September 2022.

Part XI– Participation in experiments at large-scale facilities

1) "Exploring metal solvation in Room temperature ionic liquids: the case of Cu(II), Zn(II) and Ag(I) in [C_4mim][Tf_2N]", Proposal **2017**5005, XAFS beamline, Elettra Sincrotrone Trieste, Italy, 22 – 25 February 2018.

2) "Exploring metal solvation in room temperature ionic liquids", Proposal **2018**062885, CLAESS beamline, ALBA Synchrotron Light source, Cerdanyola del Vallès, Spain, 9 – 11 March 2018.

3) "Structural properties of deep eutectic solvents in the presence of hardly soluble oxides", Proposal **2018**0157, XAFS beamline, Elettra Sincrotrone Trieste, Italy, 11 – 14 October 2018.

4) "XAS measurements of Ag(+) in ionic liquids", Proposal **2018**113206, CLAESS beamline, ALBA Synchrotron Light source, Cerdanyola del Vallès, Spain, 13 November 2018.

5) "Silver(I) solvation in dry and wet room temperature ionic liquids (RTILs)", Proposal **2019**0065, XAFS beamline, Elettra Sincrotrone Trieste, Italy, 6 – 9 November 2019.

6) "Electronic and crystal structure of Metal Organic Frameworks (MOFs) catalysts", Proposal **2020**0490, APE-HE beamline, Elettra Sincrotrone Trieste, Italy, 15 – 21 September 2020.

7) "Li(+) reversible intercalation in lithium rich-layered oxides", Proposal **2020**5109, XAFS beamline, Elettra Sincrotrone Trieste, Italy, 16 – 19 March 2021.

8) "Investigation of organic oscillators by means of a multivariate coupled XAS/UV-Vis analysis", Proposal **2020**5491 XAFS beamline, Elettra Sincrotrone Trieste, Italy, 29 March – 2 April 2021.

9) "Structural properties of metal-based deep eutectic solvents (MDESs) and their mixtures with water and methanol", Proposal **2020**7087, XAFS beamline 26 February – 1 March 2021, SAXS beamline 10 February 2021, Elettra Sincrotrone Trieste, Italy.

10) "Structural properties of deep eutectic solvents in the presence of metal oxides hardly soluble in other solvents", Proposal **2021**0186, Balder beamline, MAX IV Laboratory, Lund, Sweden, 27 – 29 October 2021.

11) "Cobalt complexation in imidazolium and phosphonium ionic liquids", Proposal **2021**0091, XAFS beamline, Elettra Sincrotrone Trieste, Italy, 23 – 26 November 2021.

12) "Ca(2+) intercalation in titanium oxides: a comparative study versus Li(+) and Na(+)", Proposal **2021**5282, XAFS beamline, Elettra Sincrotrone Trieste, Italy, 12 – 15 May 2022.

13) "Metal Organic Frameworks for water harvesting from air: an operando structural and electronic characterization", Proposal CH-6457, BM31 beamline, European Synchrotron Radiation Facility (ESRF), Grenoble, France, 27 September – 2 October 2022.

14) "Structural study of cationic surfactants in deep eutectic solvents", Proposal **2022**0613, Balder beamline, MAX IV Laboratory, Lund, Sweden, 11 – 13 November 2022.

Part XII– Courses

1) "Introduction to Modern Fortran", CINECA HPC Center, Casalecchio di Reno, Italy, 18 – 21 September 2017.

2) Quantum ESPRESSO Summer School: "Advanced Materials and Molecular Modelling" – Jožef Stefan Institute, Lubiana, Slovenia, 15 – 20 September 2019.

Part XIII– Collaborations and abroad research periods

1) Abroad research period in the Erasmus+ "Key Action 1 – Student Mobility for Traineeship" program, at "Laboratoire PHENIX" - Sorbonne Université, CNRS, Paris, France – 1 April - 16 June 2019.

2) Secondments for the "Removal and Recovery of Pharmaceutical Persistent Pollutants from Wastewater by Selective Reagentless Process" (Recopharma) - "Marie Skłodowska-Curie Research and Innovation Staff Exchange" action – RISE Horizon 2020, at AERIS Tecnologías Ambientales S.L. and Universidad Autónoma de Barcelona (UAB), 11 November 2018 – 10 January 2019 and 13 August – 12 September 2019.

Roma, 09/02/2023