

CURRICULUM VITAE

SERGIO BRUTTI

Personal Details

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Current position and titles

- Researcher (RTI a tempo pieno confermato in ruolo) at the Università degli Studi della Basilicata – Dipartimento di Scienze – viale dell’Ateneo Lucano, 85100 Potenza (presa di servizio 21/12/2011)
- Assistant Professor (professore aggregato) in Physical Chemistry of Materials (2015/2016)
- Italian national qualification (ASN 2013) as associate professor in Physical Chemistry (chim/02)
- Invited Professor at the University of Evry Val-D’Essonne (may-june 2015), France
- Associate Member of the Istituto dei Sistemi Complessi –Consiglio Nazionale delle Ricerche (from march 2012)

Education

- High school degree: “Maturità Classica Sperimentale a Indirizzo Scientifico”, Liceo Classico T. Mamiani, Roma,– Final mark 60/60 – July 1994
- Master degree in Chemistry: Università di Roma “La Sapienza” – Final dissertation “Thermodynamic stability of the intermediate phases in the Ca-Si systes” – supervisor Prof. G.Balducci – Final mark 110/110 cum laude – May 2000
- PhD degree in Chemical Sciences: Dipartimento di Chimica, Università degli Studi di Roma La Sapienza” – Thesis “Stability and reactivity at high temperatures of metallic borides and silicides” - supervisor Prof. G.Balducci – January 2004

Previous work experiences

- PhD Scholarship - Supervisor: Prof. G.Balducci - Dipartimento di Chimica - Università di Roma La Sapienza – research project: “Stability and reactivity at high temperatures of metallic borides and silicides” - November 2000-October 2003
- Research Visitor – Supervisor: Prof. T.Terai – Department of Quantum Engineering and System Science – University of Tokyo (Japan) research project “Gas-solid thermodynamics of the Yb-O-H system” – may-june 2003.
- Post-doc Fellowship - Supervisor: Prof. B. Scrosati, - Dipartimento di Chimica - Università di Roma La Sapienza – research project: “Amorphous Carbons as anodes for Li-ion batteries” – nov. 2003-apr. 2004
- Post-doc Fellowship - Supervisor: Prof. G. De Maria - Dipartimento di Chimica - Università di Roma La Sapienza – research project: “Thermodynamics of the high temperature decomposition of H₂SO₄” - May- Oct. 2004

- Post-doc Fellowship - Supervisor: Prof. D. Pettifor –Department of Materials, University of Oxford (UK)– research project: “Computational study of the energetic of metallic silicides by DFT” – nov. 2004-may 2005
- Post-doc Fellowship - Supervisor: Prof. G. De Maria - Istituto per lo Studio dei materiali Nanostrutturati (CNR) Sezione di Roma1 - research project: “Ab initio study of the gaseous adducts H₂SO₄-SO₃-H₂O” - May -June 2005
- Post-doc Fellowship - Supervisor: Prof. G. Cerri - Dipartimento di Ingegneria Meccanica ed Industriale - Università di Roma Tre - research project: “High temperature decomposition of H₂SO₄ by direct solar radiation” - July 2005 – Jan. 2007
- Post-doc Fellowship - Supervisor: Prof. G. Gigli – Dipartimento di Chimica – Università di Roma “La Sapienza” – research project: “Experimental and computational study of the thermodynamic stability of intermetallic compounds” – Feb. 2007- Jan. 2009
- Post-doc Fellowship - Supervisor: Dr. K.Aifantis – General Engineering Department - Aristotle University of Thessaloniki (Greece) – research project: “Probing the Micro-Nano Transition: Theoretical and Experimental Foundations, Simulations and Applications” – Feb. 2009- June 2009
- Co-shared post-doc Fellowship - Supervisors: Prof. Peter Bruce and Prof. Bruno Scrosati, School of Chemistry, University of St.Andrews (UK) and Dipartimento di Chimica, Sapienza Università di Roma (IT), – research project: “TiO₂ electrodes for high-performances and safe Li-ion batteries” - July 2009 - June 2011.
- Post-doc Fellowship - Supervisor: Dr. Maria Assunta Navarra, Dipartimento di Chimica, Sapienza Università di Roma (IT) – research project: “Synthesis and characterization of nanostructured ceramic materials for application in Nafion membranes” - July 2011 – Dec. 2012.

Awards and honors

- “Premio Luam 2010” for the best poster communication in physical chemistry at the “Quarto convegno giovani chimici – la chimica nelle nanoscienze e nelle nanotecnologie” conferito dall’Ordine dei Chimici.
- “Premio i giovani e la Chimica 2010 – Chimica Fisica” conferito dalla Società Chimica Italiana.

Funded research projects

- Research Unit Principal investigator of the Italian National Project FIRB Futuro in ricerca 2010 “Hydrides as high capacity anodes for Li-ion batteries” (2012- 2016) – (research unit budget: 418 kE, funding agency: Italian Government MIUR)
- Principal Investigator of the research project “Synthesis of a composite material based on LiCoPO₄ and its application innovative secondary lithium cells” (2013-2015) – (project budget: 56 kE, funding agency: Area Science Park-Basilicata Innovazione) in collaboration with Johnson-Matthey Ltd.
- Principal Investigator of the research project “Performances and failure analysis of a Na-ion cell” (2014-2015) – (project budget: 20 kE, funding agency: Area Science Park-Basilicata Innovazione) in collaboration with SAES Getters Spa.
- Principal Investigator of the research project “Assessment of the conditioning cycle of a Na-ion cell” (2015) – (project budget: 10 kE, funding agency: Area Science Park-Basilicata Innovazione) in collaboration with SAES Getters Spa.

- Principal Investigator of the research contract “Characterization of full Li-ion cells and analysis of via-gas phase degradation mechanisms” (2015-2016) – (project budget: 45 kE, private sponsor: SAES Getters Spa).
- Research Sub-Unit Principal Investigator of the Italian National Project PRIN 2010-2011 “Advanced Nanocomposite Membranes and innovative Electrocatalysts for Durable Polymer Electrolyte Membrane fuel cell”) (2013-2016) – (research sub-unit budget: 52 kE, funding agency: Italian Government MIUR)

Other competitive minor research projects

- Principal Investigator of the research grants RIL2012, RIL2013 and RIL2015 (2012-2016) – (total projects budget: 10 kE, funding agency: University of Basilicata).
- Principal Investigator of the computational research project “Electronic and dynamic properties of MgB₂ and related composition-modulated superstructures” - Bando B 2007 – Caspur – (2007 – 2009)
- Principal Investigator of the computational research project “DFT modelling of metallic nanoparticles for lithium intercalation” - Standard HPC Grant 2009 – Caspur (2009- 2010)
- Principal Investigator of the computational research project “Thermodynamic modelling by first principles calculations of metallic substitution in the TiO₂ lattice” - Standard HPC Grant 2010 – Caspur (2010- 2011)
- Principal Investigator of the computational research project “Firsts principles study of metallic and hydride-based clusters” – IS CRA class C projects - (2012 – 2013)
- Principal Investigator of the experimental campaign project “Diffraction study of the self-discharge phenomena of LiCoPO₄ in rechargeable lithium cells” (project number 20130017 MCX beamline – Elettra synchrotron radiation facility) (2013)
- Principal Investigator of the experimental campaign project “In situ diffraction study of the HCR of NaAlH₄ in lithium cells” (project number 20140458 MCX beamline – Elettra synchrotron radiation facility) (2014)
- Principal Investigator of the experimental campaign project “In situ diffraction study of sodium alanates in lithium cells” (project number 20150410 MCX beamline – Elettra synchrotron radiation facility) (2015)

Professional societies

- Member of the Italian Society of Chemistry from 2004
- Member of the American Chemical Society from 2010
- Member of the Electrochemical Society from 2012
- Member of the International Society of Electrochemistry from 2014

National and International Conferences

(Invited Lectures)

- 13th IUPAC conference on high temperature material chemistry (HTMC-XIII) – 14-19 September 2009, Davis (California, USA), lecture title “Thermodynamics at finite temperatures of the intermediate phases in the Re-B system by density functional theory and perturbational dft calculations”.
- Material Research Society 2011 Spring Meeting – 25-29 April 2011, San Francisco (California, USA), lecture title “Nanostructured TiO₂ for Lithium Batteries”.

- 243rd American Chemical Society Spring Symposium – 25-29 March 2012, San Diego (California, US), lecture title "Nanosized advanced materials for application in lithium-ion batteries"
- IUPAC NMS-VII & FCFP-XXI conferences – 16-21 October 2013, Shanghai (China), lecture title "MgH₂ conversion reaction in a lithium cells"

(Other Oral Presentations)

- Meeting on Thermodynamics of Alloys (TOFA 2002), 8-13 September 2002, Roma – Italia, lecture title "Thermodynamics of ytterbium silicides phases"
- Primo Convegno Giovani Chimici, 15-16 June 2004, Roma – Italia, lecture title "Aspetti termodinamici e cinetici della vaporizzazione di boruri di magnesio: implicazioni nella deposizione di film sottili di MgB₂"
- ECO-Efficiency Biennial, Terza Edizione, International Congress of Young Scientists on Hydrogen, 18-21 May 2005, Torino – Italia, lecture title "Solar H₂ thermochemical production and storage systems"
- Secondo Convegno Giovani Chimici, 6-7 June 2006, Roma – Italia, lecture title "Aspetti chimico-fisici del ciclo S-I per la produzione di idrogeno: decomposizione ad alta temperatura di H₂SO₄"
- World Hydrogen Technologies Convention 2007, 4-7 November 2007 Montecatini Terme – Italia, lecture title "Study of I-/I₂ poisoning of Fe₂O₃-based catalysts for the H₂SO₄ decomposition in sulphur-iodine cycle for hydrogen production"
- Technical Meeting on the Status of Hydrogen Production (IAEA – International Atomic Energy Agency), Vienna – Austria, 1-3 September 2008, lecture title "High temperature thermochemical cycles for hydrogen production: the Italian national project TEPSI"
- Nanotech-Lazio: panoramica sulle nanoscienze – 22 April 2009, Roma. lecture title "Produzione di idrogeno da energia solare: catalizzatori innovativi a base di schiume ceramiche"
- 4th ITP International Symposium – 28-29 November 2011, Roma. lecture title "LiCoPO₄ synthesis via hydrothermal and solvothermal routes for application in Li-ion batteries"
- Workshop Nuove Tecnologie Energia e Ambiente – 13 June 2012, Tito di Potenza. lecture title "Dispositivi elettrochimici avanzati per l'accumulo di energia: autotrazione ibrida vs. applicazioni stazionarie"
- 65th Annual Meeting of the International Society of Electrochemistry – 31 August-5 September 2014, Lausanne (Svizzera). lecture title "Self-discharge in LiCoPO₄ electrodes"
- XXV Congresso Nazionale della Società Chimica Italiana – 7-12 September 2014, Rende. lecture title "The MgH₂ conversion reaction in a lithium cell"
- 7th Lithium Ion Battery Discussion (LIBD 2015) – 21-26 June 2015, Arcachon (Francia), lecture title "Hydrides as novel high capacity anodes for lithium batteries"
- 1st European Conference on Physical and Theoretical Chemistry – 14-18 September 2015, Catania (Italia), lecture title "Hydrides as novel high capacity anodes for lithium batteries"