

Curriculum vitae of Salvatore Marullo

Personal information

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Education and training

- 2003: Degree in Chemistry, University of Palermo, Italy
- 2008: PhD in Chemical Science, University of Palermo, Italy

Current Position:

Associate professor in Organic Chemistry at STEBICEF Department, University of Palermo

Previous Positions

- 2008-2012 – Post doctoral position at the department of Organic Chemistry “E. Paternò” University of Palermo, Supervisor: Prof. Vincenzo Frenna
- 2012-2014 Post doctoral position at the department of Organic Chemistry “E. Paternò” University of Palermo, Supervisor: Prof. Francesca D’Anna
- Jan-Apr 2014: visiting post-doc at the department of Chemistry of the University of York (UK), Supervisor Prof. David Smith.
- 2014-2019: Assistant Professor in Organic Chemistry (RTDA) at STEBICEF Department, University of Palermo
- 2019-2022: Assistant Professor in Organic Chemistry (RTDB) at STEBICEF Department, University of Palermo

Research activity

The research activity focuses on the areas of Physical Organic Chemistry, Supramolecular and Green Chemistry, summarized as follows:

- Mechanistic study of heterocyclic rearrangement reactions;
- Study of structure and properties of Ionic Liquids and Deep Eutectic Solvents;
- Self-assembly, gelation processes and application of the relevant materials;
- Chemical recycling of polymers.

The results obtained are reported in 62 publications, of which 59 papers and 3 *reviews*, 3 book chapters and several communications in national and international meetings.

Scientific Publications

Articles

- 1) F. D'Anna, V. Frenna, G. Macaluso, S. Marullo, S. Morganti, V. Pace, D. Spinelli, R. Spisani, C. Tavani
On the Rearrangement in Dioxane/Water of (*Z*)-Arylhydrazones of 5-Amino-3-benzoyl-1,2,4-oxadiazole into (2-Aryl-5-phenyl-2*H*-1,2,3-triazol-4-yl)ureas: Substituent Effects on the Different Reaction Pathways.
J. Org. Chem. **2006**, *71*, 5616.
- 2) F. D'Anna, V. Frenna, S. Guernelli, G. Macaluso, S. Marullo, D. Spinelli
Isomerization and Rearrangement of (*E*)- and (*Z*)-phenylhydrazones of 3-benzoyl-5-phenyl-1,2,4-oxadiazole: evidence for a new type of acid-catalysis by copper (II) salts in mononuclear rearrangement of heterocycles.
J. Phys. Org. Chem. **2008**, *21*, 306.
- 3) F. D'Anna, S. Marullo, R. Noto
Ionic Liquids/[bmim][N₃] Mixtures: Promising Media for the Synthesis of Aryl Azides by S_NAr.
J. Org. Chem. **2008**, *73*, 6224.
- 4) F. D'Anna, V. Frenna, S. Marullo, R. Noto, D. Spinelli
Mononuclear rearrangement of heterocycles in ionic liquids catalyzed by copper(II) salts.
Tetrahedron **2008**, *64*, 11209.
- 5) F. D'Anna, V. Frenna, S. Guernelli, C. Z. Lanza, G. Macaluso, S. Marullo, D. Spinelli
New examples of specific-base catalysis in mononuclear rearrangements of heterocycles found via a designed modification of the side-chain structure.
ARKIVOC **2009**, *8*, 125.
- 6) F. D'Anna, S. Marullo, P. Vitale, R. Noto
Electronic and Steric Effects: How Do They Work in Ionic Liquids? The Case of Benzoic Acid Dissociation.
J. Org. Chem. **2010**, *75*, 4828.
- 7) F. D'Anna, S. Marullo, R. Noto
Aryl Azides Formation Under Mild Conditions: A Kinetic Study in Some Ionic Liquid Solutions.
J. Org. Chem. **2010**, *75*, 767.

- 8) F. D'Anna, V. Frenna, C. Z. Lanza, G. Macaluso, S. Marullo, D. Spinelli, R. Spisani, G. Petrillo
On the use of multi-parameter free energy relationships: the rearrangement of (*Z*)-arylhydrazones of 5-amino-3-benzoyl-1,2,4-oxadiazole into (2-aryl-5-phenyl-2H-1,2,3-triazol-4-yl)ureas.
Tetrahedron **2010**, *66*, 5442.
- 9) F. D'Anna, V. Frenna, F. Ghelfi, G. Macaluso, S. Marullo, D. Spinelli
Apolar versus polar solvents: a comparison of the strength of some organic acids against different bases in toluene and in water.
J. Phys. Chem. A **2010**, *114*, 10969.
- 10) F. D'Anna, G. Fontana, V. Frenna, G. Macaluso, S. Marullo, D. Spinelli
A deep insight into the mechanism of the acid-catalyzed rearrangement of the (*Z*)-phenylhydrazone of 5-amino-3-benzoyl-1,2,4-oxadiazole in a non-polar solvent.
J. Phys. Org. Chem. **2011**, *24*, 185.
- 11) F. D'Anna, V. Frenna, F. Ghelfi, S. Marullo, D. Spinelli
Acid and base-catalysis in the mononuclear rearrangement of some (*Z*)-arylhydrazones of 5-amino-3-benzoyl-1,2,4-oxadiazole in toluene: effect of substituents on the course of reaction.
J. Org. Chem. **2011**, *76*, 2672.
- 12) F. D'Anna, S. Marullo, P. Vitale, R. Noto
The effect of the cation π -surface area on the 3D organization and catalytic ability of Imidazolium-based Ionic liquids.
Eur. J. Org. Chem. **2011**, 5681.
- 13) F. D'Anna, S. Marullo, P. Vitale, R. Noto
Synthesis of aryl azides: a probe reaction to study the synergetic action of ultrasounds and ionic liquids.
Ultrason. Sonochem. **2012**, *19*, 136.
- 14) F. D'Anna, S. Marullo, P. Vitale, R. Noto
Binary mixtures of ionic liquids: a joint approach to investigate their properties and catalytic ability.
ChemPhysChem **2012**, *13*, 1877.
- 15) F. D'Anna, S. Marullo, P. Vitale, R. Noto
Geminal imidazolium salts: a new class of gelators.
Langmuir **2012**, *28*, 10849.
- 16) M. D'Auria, V. Frenna, S. Marullo, R. Raccioppi, D. Spinelli, L. Viggiani
Photochemical isomerization of aryl hydrazones of 1,2,4-oxadiazole derivatives into the corresponding triazoles.
Photochem. Photobiol. Sci. **2012**, *11*, 1383.

- 17) S. Marullo, F. D'Anna, M. Cascino, R. Noto
Molecular "pincer" from diimidazolium salt. A study of binding ability.
J. Org. Chem. **2013**, *78*, 10203.
- 18) F. D'Anna, P. Vitale, F. Ferrante, S. Marullo, R. Noto
The Gelling Ability of Some Diimidazolium Salts: Effect of Isomeric Substitution of the Cation and Anion.
ChemPlusChem **2013**, *78*, 331.
- 19) C. Rizzo, F. D'Anna, S. Marullo, P. Vitale, R. Noto
Two-Component Hydrogels Formed by Cyclodextrins and Dicationic Imidazolium Salts.
Eur. J. Org. Chem. **2014**, 1013.
- 20) F. D'Anna, S. Marullo, P. Vitale, C. Rizzo, P. Lo Meo, R. Noto
Ionic liquid binary mixtures: Promising reaction media for carbohydrate conversion into 5-hydroxymethylfurfural.
Appl. Catal. A **2014**, *482*, 287.
- 21) C. Rizzo, F. D'Anna, S. Marullo, R. Noto
Task specific Dicationic Ionic Liquids: Recyclable reaction media for the mononuclear rearrangement of heterocycles.
J. Org. Chem. **2014**, *79*, 8678.
- 22) S. Marullo,* F. D'Anna,* C. Rizzo, R. Noto
The ultrasounds-ionic liquids synergy on the copper catalyzed azide-alkyne cycloaddition between phenylacetylene and 4-azidoquinoline.
Ultrason. Sonochem. **2015**, *23*, 317.
- 23) P. Vitale, F. D'Anna, S. Marullo, R. Noto
Organic salts and aromatic substrates in two-component gel phase formation: the study of properties and release processes.
Soft Matter **2015**, *11*, 6652.
- 24) F. D'Anna,* S. Marullo,* G. Lazzara, P. Vitale, R. Noto
Aggregation processes of perylene diimidazolium salts.
Chem. Eur. J. **2015**, *21*, 14780.
- 25) A. Paternò, R. Fiorenza, S. Marullo, G. Musumarra, S. Scirè.
Prediction of ionic liquid's heat capacity by means of their in silico principal properties
RSC Adv. **2016**, *6*, 36085.
- 26) F. Billeci, F. D'Anna, S. Marullo, R. Noto.
Self-assembly of fluorescent diimidazolium salts: Tailor properties of the aggregates changing alkyl chain features
RSC Adv. **2016**, *6*, 59502.

- 27) S. Marullo, F. D'Anna, P. R. Campodonico, R. Noto.
Ionic liquid binary mixtures: How different factors contribute to determine their effect on the reactivity
RSC Adv. **2016**, *6*, 90165.
- 28) N.T. Dintcheva, R. Arrigo, R. Teresi, B. Megna, C. Gambarotti, S. Marullo, F. D'Anna.
Tunable radical scavenging activity of carbon nanotubes through sonication.
Carbon **2016**, *107*, 240
- 29) S. Marullo,* M. Feroci, R. Noto, F. D'Anna*
Insights into the anion effect on the self assembly of perylene bisimide diimidazolium salts.
Dyes Pigm. **2017**, *146*, 54.
- 30) F. D'Anna, C. Rizzo, P. Vitale, S. Marullo, F. Ferrante
Supramolecular complexes formed by dimethoxypillar[5]arenes and imidazolium salts: a joint experimental and computational investigation.
New. J. Chem. **2017**, *41*, 12490.
- 31) F. Billeci, F. D'Anna, I. Chiarotto, M. Feroci, S. Marullo
The anion impact on the self-assembly of naphthalene diimide diimidazolium salts.
New. J. Chem. **2017**, *41*, 13889.
- 32) S. Marullo,* C. Rizzo, N. T. Dintcheva, F. Giannici, F. D'Anna.*
Ionic liquids gels: Soft materials for environmental remediation.
J. Colloid Interface Sci. **2018**, *517*, 182.
- 33) C. Rizzo, S. Marullo, P. R. Campodonico, I. Pibiri, N. T. Dintcheva, D. Millan, R. Noto, F. D'Anna.
Self-sustaining Supramolecular Ionic Liquid Gels for Dye Adsorption.
ACS Sustainable Eng. Chem. **2018**, *6*, 12453.
- 34) S. Marullo, A. Meli, F. Giannici, F. D'Anna.
Supramolecular Eutecto Gels: Fully Natural Soft Materials
ACS Sustainable Eng. Chem. **2018**, *6*, 12598.
- 35) S. Marullo, C. Rizzo, F. D'Anna.
Task-specific Organic Salts and Ionic Liquids Binary mixtures: a Combination to Obtain 5-hydroxymethylfurfural from Carbohydrates.
Front. Chem. **2019**, *7*, 134.
- 36) S. Marullo, C. Rizzo, A. Meli, F. D'Anna.
Ionic liquids binary mixtures, zeolites and ultrasound irradiation: a combination to promote carbohydrates conversion into 5-hydroxymethylfurfural.
ACS Sustainable Eng. Chem. **2019**, *7*, 5818.
- 37) C. Rizzo, A. Mandoli, S. Marullo, F. D'Anna
Ionic Liquid Gels: Supramolecular Reaction Media for the Alcoholysis of Anhydrides.
J. Org. Chem **2019**, *84*, 6356.

- 38) S. Marullo, C. Rizzo, F. D'Anna.
Activity of a Heterogeneous Catalyst in Deep Eutectic Solvents: the Case of Carbohydrate Conversion into 5-Hydroxymethylfurfural.
ACS Sustainable Eng. Chem. **2019**, *7*, 13359.
- 39) C. Rizzo, S. Marullo, N. T. Dintcheva, F. D'Anna
Carbon Nanomaterial Doped Ionic Liquid Gels for the Removal of pharmaceutically Active Compounds from Water
Molecules **2019**, *24*, 2788.
- 40) C. Rizzo, S. Marullo, N. T. Dintcheva, C. Gambarotti, F. Billeci, F. D'Anna
Ionic liquid gels and antioxidant carbon nanotubes: Hybrid soft materials with improved radical scavenging activity.
J. Colloid Interface Sci. **2019**, *556*, 628.
- 41) S. Marullo, A. Meli, N. T. Dintcheva, G. Infurna, C. Rizzo, F. D'Anna
Environmentally Friendly Eutectogels Comprising L-amino Acids and Deep Eutectic Solvents: Efficient Materials for Wastewater Treatment
ChemPlusChem **2020**, *85*, 301
- 42) R. Teresi, S. Marullo, C. Gambarotti, F. Parisi, B. Megna, G. Lazzara, F. D'Anna, N. T. Dintcheva
Improvement of oxidation resistance of polymer-based nanocomposites through sonication of carbonaceous nanoparticles
Ultrason. Sonochem. **2020**, *61*, 104807
- 43) S. Marullo, A. Meli, F. D'Anna
A Joint Action of Deep Eutectic Solvents and Ultrasound to Promote Diels–Alder Reaction in a Sustainable Way.
ACS Sustainable Eng. Chem. **2020**, *8*, 4889
- 44) S. Marullo, A. Sutera, G. Gallo, F. Billeci, C. Rizzo, F. D'Anna
Chemo-enzymatic Conversion of Glucose in 5-Hydroxymethylfurfural: The Joint Effect of Ionic Liquids and Ultrasound.
ACS Sustainable Chem. Eng. **2020**, *8*, 11204
- 45) C. Rizzo, P. Cancemi, L. Mattiello, S. Marullo, F. D'Anna
Naphthalimide Imidazolium-Based Supramolecular Hydrogels as Bioimaging and Theranostic Soft Materials
ACS Appl. Mater. Interfaces **2020**, *12*, 48442
- 46) C. Rizzo, S. Marullo, F. D'Anna
Carbon-based ionic liquid gels: alternative adsorbents for pharmaceutically active compounds in wastewater
Environ. Sci.: Nano **2021**, *8*, 131
- 47) C. Rizzo, S. Marullo, M. Feroci, V. Accurso, F. D'Anna
Insights into the effect of the spacer on the properties of imidazolium based AIE luminogens

Dyes Pigm. **2021**, 186, 109035

- 48) S. Marullo, F. D'Anna
Interplay of Acidity and Ionic Liquid Structure on the Outcome of a Heterocyclic Rearrangement Reaction
J. Org. Chem. **2021**, 86, 4045
- 49) F. D'Anna, F. Pandolfi, D. Rocco, S. Marullo, M. Feroci, L. Mattiello
Solvatochromic behaviour of new donor–acceptor oligothiophenes
New J. Chem. **2021**, 45, 11636
- 50) F. D'Anna, M. Sbacchi, G. Infurna, N. T. Dintcheva, S. Marullo
Boosting the Methanolysis of Polycarbonate by the Synergy between Ultrasounds Irradiation and Task Specific Ionic Liquids
Green Chem. **2021**, 23, 9957
- 51) S. Marullo, C. Rizzo, N. T. Dintcheva, F. D'Anna
Amino Acid-Based Cholinium Ionic Liquids as Sustainable Catalysts for PET Depolymerization
ACS Sustainable Chem. Eng. **2021**, 9, 15157
- 52) C. Rizzo, G. Misia, S. Marullo, F. Billeci, F. D'Anna
Bio-based Chitosan and Cellulose Ionic Liquid Gels: Polymeric Soft Materials for the Desulfurization of Fuel
Green Chem. **2022**, 24, 1318
- 53) G. Infurna, L. Botta, M. Maniscalco, E. Morici, S. Marullo, G. Caputo, F. D'Anna, N. T. Dintcheva
Biochar Particles Obtained from Agricultural Carob Waste as a Suitable Filler for Sustainable Biocomposite Formulations
Polymers **2022**, 14, 3075
- 54) S. Marullo, M. Tiecco, R. Germani, F. D'Anna
Highly recyclable surfactant-based supramolecular eutectogels for iodine removal
J. Mol. Liq. **2022**, 362, 119712
- 55) S. Marullo, F. D'Anna
How Ionic Liquid Gels Work on the Removal of Bisphenol A from Wastewater
ACS Mater. Au **2023**, 3, 112
- 56) S. Marullo, F. Petta, G. Infurna, N. T. Dintcheva, F. D'Anna
Polysaccharide-based supramolecular bicomponent eutectogels as sustainable antioxidant Materials
Green Chem. **2023**, 25, 4513
- 57) S. Marullo, G. Gallo, G. Infurna, N. T. Dintcheva, F. D'Anna
Antimicrobial and antioxidant supramolecular ionic liquid gels from biopolymer mixtures

- 58) C. Rizzo, P. Cancemi, M. Buttacavoli, G. Di Cara, C. D'Amico, F. Billeci, S. Marullo, F. D'Anna
Insights about the ability of folate based supramolecular gels to act as targeted therapeutic agents
J. Mat. Chem. B **2023**, *11*, 7721
- 59) C. Rizzo, S. Marullo, M. Benaglia, F. D'Anna
DBS-Based Eutectogels: Organized Vessels to Perform the Michael Addition Reaction
Eur. J. Org. Chem. **2023**, *26*, e202300263

Reviews

- 60) S. Marullo, F. D'Anna, C. Rizzo, F. Billeci
Ionic liquids: "normal" solvents or nanostructured fluids?
Org. Biomol. Chem. **2021**, *19*, 2076.
- 61) C. Rizzo, S. Marullo, F. Billeci, F. D'Anna
Catalysis in Supramolecular Systems: the Case of Gel Phases
Eur. J. Org. Chem. **2021**, *19*, 2076.
- 62) S. Marullo, F. D'Anna
The Role Played by Ionic Liquids in Carbohydrates Conversion into 5-Hydroxymethylfurfural: A Recent Overview
Molecules. **2022**, *27*, 2210.

Book Chapters

- 1) C. Rizzo, S. Marullo, F. Billeci, F. D'Anna, *Ionic liquids as extraction solvents for removal of dyes*, in *Ionic Liquid-based Technologies for Environmental Sustainability*, eds. M. Jawaidh, A. Ahmad, A. V. B. Reddy, 2022, Elsevier, ISBN: 978-0-12-824545-3
- 2) S. Marullo, C. Rizzo, F. D'Anna, *Organic Salts as Tectons for Self-assembly Processes in Solution*, in *Supramolecular Assemblies Based on Electrostatic Interactions*, eds. A. M. Aboudzadeh, A. Frontera, 2022, Springer, ISBN: 978-3-031-00657-9.
- 3) S. Marullo, F. D'Anna, *Synthesis of heterocycles in non-conventional media: the case of ionic liquids*, in *Targets in Heterocyclic Chemistry*, eds. O. Attanasi, B. Gabriele, D. Spinelli, 2022, Società Chimica Italiana, ISBN: 978-88-94952-33-9.