

Dr. Carlo Pastore

Istituto di Ricerca sulle Acque (IRSA-CNR)
Consiglio Nazionale delle Ricerche

Via de Blasio 5,
70132 Bari - Italy
Tel. +390805820514

e-mail: carlo.pastore@ba.irsas.cnr.it

Born in Putignano (BA)- Italy on the 5th February, 1977.

Present Position: Researcher

Areas of scientific interest: Chemical characterization of unknown complex mixture. Biomass characterization and chemical valorisation. Ligno-cellulosic material activation for obtaining unconventional biofuel. Valorisation of waste-oil for producing biodiesel. Carbon dioxide utilization in chemical and enzymatic synthesis. Homogeneous and heterogeneous catalysis. Coordination Chemistry and Organometallic Chemistry. Chemistry of metal centres in low oxidation state as catalysts in organic synthesis. Green Chemistry. Use of non conventional media (Supercritical Fluids).

Education: Ph.D. in “Chemical and Enzymatic Applied Synthesis”, XVII cycle, at the University of Bari on March 2004. Title of the thesis: “Utilization of Carbon Dioxide for the functionalization of organic substrates with the assistance of metal complexes or enzymatic systems”.

Doctor degree in Chemistry at the University of Bari on October 2001 with laude. Thesis in Inorganic Chemistry: “Development of alternative methods for the synthesis of dialkylcarbonates: activation of ethers”.

Previous Experiences in Chemical Research

1st June, 2010/30th Novembre, 2011

METEA Center, VALBIOR Project

- *Development of innovative methods for the Valorization of residual Apulian Biomasses*
- *Ligno-cellulosic waste valorization to produce platform-molecules: HMF*
- *Brown olive grease conversion into biofuel*

10th October, 2009/15th September, 2011

ISOA s.r.l.

- *Development of alternative treatment of wastewater produced into a oil-refining plant*
- *Development of new analysis protocols for characterizing a oily complex matrice*

10th November, 2008/ 9th October, 2009

Mythen SpA

- *Management and development of analytical techniques involved in chemical characterization of wastewater produced in a biodiesel utility*
- *Optimization of the operative conditions of a pilot chromatographic plant ISMB, Improved Simulated Moving Bed, for recovering glycerol from plant wastewater*
- *Development of low-costs procedures to trap and destroy aldehydes in wastewater*

- Use of bench-scale utilities (micro-reactors, column distillation and molecular distillator) for continuous processes involved in the production of biofuels

01st May, 2005/ 30th October, 2008

Università degli Studi di Bari

Synthesis of innovative (homogeneous and heterogeneous) catalysts for the direct carboxylation of alcohols to give di-alkyl-carbonates

29th Dicembre, 2001 / 30th November, 2004

Università degli Studi di Bari

Ph.D. "Chemical and Enzymatic Applied Synthesis" (XVII Cycle)

Utilization of Carbon Dioxide for the functionalization of organic substrates with the assistance of metal complexes or enzymatic systems

2nd January, 2005 / 30th December, 2007

CIRCC (Interuniversity Consortium in Chemical Reactivity and Catalysis)

Synthesis, Characterization and Reactivity of new catalysts for DMC production from methanol and CO₂

2nd January, 2005 / 30th April, 2005

Università degli Studi di Bari

Synthesis and solid and solution NMR characterization of Palladium and Rhodium hydrides for hydrogenation reaction and Allene/CO₂ coupling

November / December 2004

Università degli Studi di Bari

New sustainable methods for the production of di-alkyl-carbonates

2nd January, 2003/ 30th March, 2006

Center of research in Agriculture, CRSA, "Basile Caramia", Locorotondo, Bari

Development of new analytical techniques for:

- determination of residual pesticides on aqueous and alimentary samples;*
- chimico-physical analysis of soils;*
- chemical characterization of grapes and wines*

1st October, 2005/ 30th March, 2006

Mediterranean Agronomical Institute of Bari (IAMB, Valenzano)

Building-up of a chemical laboratory for the analysis of bio-pesticides on olive drupes (azadiractine, rotenone, pyretrine and copper)

1st February, 2002 / 30th October, 2002

INCA, Venezia, Environmental Consortium

*Sustainable treatment of industrial high phenolic wastewater coming from agro-alimentary transformations through biological (*Thauera Aromatica*) and chemical processes*

Academic roles: Academic tutor for specialistic thesis of several students and foreign students. Professor assistant in academic courses (Inorganic Chemistry, Synthesis and Use of Inorganic Catalysts, Laboratory courses etc.).

Scientific collaborations: University of Torino, Solid state NMR and use of para-hydrogen molecule. ICCOM-CNR Firenze, NMR under high pressure. University of Palermo, Vapor Liquid Equilibria in supercritical system and/or high pressure system. Hungarian Academy of Science Budapest, DFT calculations on chemical processes of hydrogenation. University of Ghent, Microkinetic and computational fitting.

Publications:

1. Enantioselective synthesis of organic carbonates promoted by Nb(IV) and Nb(V) catalysts
Aresta Michele, Dibenedetto Angela, Gianfrate Libero, Pastore Carlo
Applied Catalysis, A: General (2003), 255(1), 5–11
2. Nb(V) compounds as epoxides carboxylation catalysts: the role of the solvent
Aresta Michele, Dibenedetto Angela, Gianfrate Libero, Pastore Carlo
Journal of Molecular Catalysis A: Chemical (2003), 204-205, 245–252
3. Synthesis and Characterization of Nb(OR)₄[OC(O)OR] (R = Me, Et, Allyl) and Their Reaction with the Parent Alcohol To Afford Organic Carbonates
Aresta Michele, Dibenedetto Angela, Pastore Carlo
Inorganic Chemistry (2003), 42(10), 3256–3261
4. An integrated approach to the synthesis of organic carbonates: discovery of new catalysts
Aresta Michele, Dibenedetto Angela, Pastore Carlo
Preprints of Symposia - American Chemical Society, Division of Fuel Chemistry (2004), 49(1), 356–357
5. Group 5 (V, Nb and Ta) element-alkoxides as catalysts in the trans-esterification of ethylene-carbonate with methanol, ethanol and allyl alcohol
Aresta Michele, Dibenedetto Angela, Pastore Carlo
Studies in Surface Science and Catalysis (2004), 153 (Carbon Dioxide Utilization for Global Sustainability), 221–226
6. Biotechnology to develop innovative syntheses using CO₂
Aresta Michele, Dibenedetto Angela, Pastore Carlo
Environmental Chemistry Letters (2005), 3(3), 113–117
7. Mechanism of Formation of Organic Carbonates from Aliphatic Alcohols and Carbon Dioxide under Mild Conditions Promoted by Carbodiimides. DFT Calculation and Experimental Study
Aresta Michele, Dibenedetto Angela, Fracchiolla Elisabetta, Giannoccaro Potenzo, Pastore Carlo, Papai Imre, Schubert Gabor
Journal of Organic Chemistry (2005), 70(16), 6177–6186
8. Direct carboxylation of alcohols to organic carbonates: Comparison of the Group 5 element

alkoxides catalytic activity

Dibenedetto Angela, Pastore Carlo, Aresta Michele
Catalysis Today (2006), 115(1-4), 88–94

9. A study on the carboxylation of glycerol to glycerol carbonate with carbon dioxide, the role of the catalyst, solvent and reaction conditions

Aresta Michele, Dibenedetto Angela, Nocito Francesco, Pastore Carlo
Journal of Molecular Catalysis A: Chemical (2006), 257(1-2), 149–153

10. Reaction mechanism of the direct carboxylation of methanol to dimethylcarbonate: experimental and theoretical studies

Aresta Michele, Dibenedetto Angela, Pastore Carlo, Papai Imre, Schubert Gabor
Topics in Catalysis (2006), 40(1-4), 71–81

11. On the existence of the elusive monomethyl ester of carbonic acid [CH₃OC(O)OH] at 300 K: ¹H- and ¹³C NMR measurements and DFT calculations

Dibenedetto Angela, Aresta Michele, Giannoccaro Potenzo, Pastore Carlo, Papai Imre, Schubert Gabor

European Journal of Inorganic Chemistry (2006), (5), 908–913

12. First in vitro use of the phenylphosphate carboxylase enzyme in supercritical CO₂ for the selective carboxylation of phenol to 4-hydroxybenzoic acid

Dibenedetto, Angela, Lo Noce Rosa, Pastore Carlo, Aresta Michele, Fragale Carlo
Environmental Chemistry Letters (2006), 3(4), 145–148

13. Synthesis of cyclic carbonates from epoxides: Use of reticular oxygen of Al₂O₃ or Al₂O₃-supported CeOx for the selective epoxidation of propene

Dibenedetto Angela, Aresta Michele, Nocito Francesco, Pastore Carlo, Venezia Anna M., Chirykalova Ekaterina, Kononenko Vladimir I., Shevchenko Vladimir G., Chupova Irina A.
Catalysis Today (2006), 115(1-4), 117–123

14. Use of reticular oxygen of metal oxides for the selective epoxidation of propene

Dibenedetto Angela, Aresta Michele, Pastore Carlo, Nocito Francesco
Preprints - American Chemical Society, Division of Petroleum Chemistry (2007), 52(2), 273

15. Evidence for spontaneous release of acrylates from a transition-metal complex upon coupling ethene or propene with a carboxylic moiety or CO₂

Aresta Michele, Pastore Carlo, Giannoccaro Potenzo, Kovacs Gabor, Dibenedetto Angela, Papai Imre

Chemistry--A European Journal (2007), 13(32), 9028–9034

16. Thermal desorption of polychlorobiphenyls from contaminated soils and their hydrodechlorination using Pd- and Rh-supported catalysts

Aresta Michele, Dibenedetto Angela, Fragale Carlo, Giannoccaro Potenzo, Pastore Carlo, Zammiello Davide, Ferragina Carla

Chemosphere (2008), 70(6), 1052–1058

17. Hybrid Material for CO₂ Uptake from Simulated Flue Gases: Xerogels Containing Diamines

Aresta Michele, Pastore Carlo, Dibenedetto Angela, Carlo Fragale
ChemSusChem (2008), 1, 742–745

18. Cerium(IV) oxide modification by inclusion of a hetero-atom: A strategy for producing efficient

and robust nano-catalysts for methanol carboxylation

Aresta Michele, Dibenedetto Angela, Pastore Carlo, Cuocci Carmela, Aresta Brunella, Cometa Stefania, De Giglio Elvira
Catalysis Today (2008), 137, 125–131

19. High Throughput Experiment Approach to the Oxidation of Propene to Propene Oxide with Transition Metal Oxides as O-Donors

Dibenedetto Angela, Aresta Michele, Distaso Monica, Pastore Carlo, Venezia Anna Maria, Liu Chang-jun, Zhang Mingbo
Catalysis Today (2008), 137, 44–51

20. Synthesis of Dimethyl Carbonate from Methanol and CO₂: a Comparative Study of Homogeneous and Heterogenized Catalysts

Aresta Michele, Dibenedetto Angela, Pastore Carlo
235th ACS National Meeting, New Orleans, Louisiana, United States, April 6-10, 2008, FUEL-116

21. Modified Cerium(IV)Oxide for an Efficient Carboxylation of Methanol

Aresta Michele, Dibenedetto Angela, Pastore Carlo, Aresta Brunella
235th ACS National Meeting, New Orleans, Louisiana, United States, April 6-10, 2008, FUEL-153

22. Comparison of the behaviour of supported homogeneous catalysts in the synthesis of dimethylcarbonate from methanol and carbon dioxide: Polystyrene-grafted tin-metallorganic species versus silesquioxanes linked Nb-methoxo species

Aresta Michele, Dibenedetto Angela, Nocito Francesco, Pastore Carlo
Inorganica Chimica Acta (2008), 361, 3215–3220

23. Synthesis and X-ray characterization of [RhCl(C₂H₄)(P*i*Pr₃)₂]. Multinuclear NMR and DFT investigation of its solid-state and solution reaction with dihydrogen. Ethene and Propene hydrogenation by the solid Rh-hydrides

Aresta Michele, Pastore Carlo, Giannoccaro Potenzo, Dibenedetto Angela, Papai Imre, Antonella Angelini, Eugenio Quaranta, Michele R. Chierotti, Roberto Gobetto, Claudia Graiff, Antonio Tiripicchio
Dalton Trans. (2009), 7924–7933

24. Influence of Al₂O₃ on the performance of CeO₂ used as catalyst in the direct carboxylation of methanol to dimethylcarbonate and the elucidation of the reaction mechanism

Aresta Michele, Dibenedetto Angela; Pastore Carlo, Angelini Antonella, Aresta Brunella, Papai Imre
Journal of Catalysis (2010), 269, 44–52

25. Identification of low molecular weight organic acids by ion chromatography/hybrid quadrupole time-of-flight mass spectrometry during Uniblu-A ozonation.

Amorisco Apollonia, Locaputo Vito, Pastore Carlo, Mascolo Giuseppe
Rapid Commun. Mass Spectrom. (2013), 27(1), 187–199

26. Biodiesel from dewatered wastewater sludge: A two-step process for a more advantageous production

Pastore Carlo, Lopez Antonio, Lotito Vincenzo, Mascolo Giuseppe
Chemosphere (2013), 92(6), 667–673

27. The Biochemistry of *Sabella spallanzanii* (Annelida: Polychaeta): A Potential Resource for the Fish Feed Industry

Stabili L., Sicuro B., Daprà F., Gai F., Abete C., Dibenedetto A., Pastore C., Schirosi R., Giangrande A.

Journal of the World Aquaculture Society (2013), 44(3), 384–395

28. Efficient conversion of brown grease produced by municipal wastewater treatment plant into biofuel using aluminium chloride hexahydrate under very mild conditions

Pastore Carlo, Lopez Antonio, Mascolo Giuseppe

Bioresour. Technol. (2014), 155, 91–97