

Surname ALBANESE

Forname DOMENICO



Title ASSOCIATE PROFESSOR

PHONE ++39-2-50314165

E-MAIL DOMENICO.ALBANESE@UNIMI.IT

CURRICULUM VITAE

a) Education

1988 Laurea in Industrial Chemistry (five-year course- Università degli Studi di Milano)

1992 Ph. D. (Università degli Studi di Milano)

1992 Danmark Teknische Hoijskole, Lyngby, Denmark.

1993-4 Post-graduate master in Organic Chemistry (Università degli Studi di Milano)

1995-6 Post doctorate fellowship (Università degli Studi di Milano)

1997 Imperial College of Science Technology and Medicine (study visit award – European Science Programme)

2001 Assistant Professor (Università degli Studi di Milano)

2008 Associate Professor (Università degli Studi di Milano)

b) Lectures

- "Selective fluorination of organic compounds with tetraalkylammonium fluorides and polyfluorides" Lyngby, Danmark Tekniske Universitet (27/5/92).
- "Ring opening of epoxides under solid-liquid phase transfer catalysis conditions" London, Imperial College of Science, Technology and Medicine (23/6/97).
- "Functional group transformation under phase transfer catalysis conditions" Gargnano XXIX Summer School "A. Corbella" 14/6/04.

TEACHING

Courses

Master Degree in Industrial Chemistry

- Advanced Industrial Chemistry with Laboratory (9 CFU)

Bachelor in Industrial Chemistry

- Industrial Chemistry (2 CFU)

Bachelor in Natural Science

- Organic Chemistry (3 CFU)

RESEARCH INTERESTS

1) **Catalysis, synthetic methodologies and fine chemistry processes**

- New applications of phase transfer catalysis to organic synthesis. The synthesis of benzoxazines, tetrahydroquinoxalines and morfolines are under investigation.
- Environmentally friendly synthesis of bioactive heterocyclic compounds under phase transfer catalysis conditions.
- Synthesis of hypervalent silicon reagents and their use in homo-coupling, cross-coupling and fluorination reactions.
- Design of new C_2 -symmetric chiral auxiliaries and chiral crown ethers.
- Stereoselective sulfide to sulfoxide oxidation.

3) **Life Sciences: bioactive molecules and natural products**

- Synthesis of non toxic organic antifoulants to control biofilm formation on contemporary art and design objects

PUBLICATIONS

ELENCO DI TUTTE LE PUBBLICAZIONI SCIENTIFICHE:

1. Albanese, D.; Landini, D.; Penso, M.; " Reduction of Allylic Nitrocompounds to Oximes with Carbon Disulfide under Solid-Liquid Phase Transfer Catalysis Conditions " *Synthesis* **1990**, 333-336.
2. Albanese, D.; Landini, D.; Penso, M.; Pozzi, G.; " One pot conversion of Allylic Nitrocompounds into Nitriles with Carbon Disulfide under Phase Transfer Catalysis Conditions" *Synth. Commun.* **1990**, 20, 965.

3. Albanese, D.; Penso, M.; " Synthesis of Isothiocyanates by reaction of Amides with Carbon Disulfide in the presence of Solid K_2CO_3 -NaOH Mixture" *Synthesis* **1991**, 1001.
4. Albanese, D.; Landini, D.; Penso, M.; " Synthesis of 2-Amino Acids via selective Mono *N*-Alkylation of Trichloroacetamide by 2-Bromo Carboxylic Esters under Solid-Liquid PTC Conditions " *J. Org. Chem.* **1992**, 57, 1603.
5. Landini, D.; Albanese, D.; Mottadelli, S.; Penso, M.; " Finkelstein Reaction with Aqueous Hydrogen Halides Efficiently Catalysed by Lipophilic Quaternary Onium Salts" *J. Chem. Soc. Perkin Trans. 1* **1992**, 2309.
6. Penso, M.; Mottadelli, S.; Albanese, D. " Reductive Dehalogenation of Haloketone Promoted by Hydroiodic Acid and without Solvent" *Synth. Commun.* **1993**, 1385-1391.
7. Landini, D.; Albanese, D.; Penso, M.; "Regioselective Conversion of *O*-Protected Glycidols to Fluorohydrins Catalyzed by Tetrabutylammonium Dihydrogen trifluoride Under Solid-Liquid PTC Conditions" *Tetrahedron* **1992**, 48, 4163.
8. Lundt, I.; Albanese, D.; Landini, D.; Penso, M. " Regioselective Opening of Epoxyaldonolactones to Fluorodeoxylactones Using Tetrabutylammonium Dihydrogen trifluoride" *Tetrahedron* **1993**, 49, 7295.
9. Albanese, D.; Landini, D.; Penso, M.; Pratelli, M.; "Tetrabutylammonium Dihydrogen trifluoride : an Effective Source of Fluoride Ion for Halofluorination of Alkenes " *Gazz. Chim. It.* **1991**, 121, 537-541.
10. Albanese, D.; Landini, D.; Penso, M. " Tetrabutylammonium Fluoride: a Powerful Catalyst for the Regioselective Opening of Epoxides with Thiols" *Synthesis* **1994**, 34.
11. Landini, D.; Rolla, F.; Penso, M.; Maia, A.; Albanese, D. "Phase Transfer Catalysis (PTC): a powerful tool for the organic synthesis" *Mem. Fis. Acc. Lincei* **1994**, 391, 131.
12. Albanese, D.; Landini, D.; Maia, A.; Penso, M. "Tetrabutylammonium Dihydrogen trifluoride as a Powerful Catalyst in the Regioselective Opening of Epoxides with Activated Aromatic and Heteroaromatic Chlorides" *Synlett*, **1995**, 853.
13. Albanese, D.; Landini, D.; Penso, M.; Spanò, G.; Trebicka, A. "Chemoselective *N*-alkylation of 2-hydroxycarbazole as a model for the synthesis of *N*-substituted pyrrole derivatives containing acidic functions" *Tetrahedron*, **1995**, 51, 5681-5688.
14. Albanese, D.; Landini, D.; Penso, M. "Synthesis of Pentacoordinated Tetraalkylammonium and Tetraalkylphosphonium Difluorosilicates" *Tetrahedron Lett.* **1995**, 36, 8865-8866.
15. Albanese, D.; Corcella, F.; Landini, D.; Penso, M. "Chemoselective *N*-Deprotection of *t*-Butyl *N*-(Trifluoroacetyl)-2-amino Esters Under PTC Conditions: Synthesis of *t*-Butyl 2-Aminocarboxylic Esters" *J. Chem. Soc. Perkin Trans. 1* , **1997**, 247-249.

16. Albanese, D.; Landini, D.; Penso, M "Regioselective Opening of Epoxides to β -Amido Alcohols Under Solid-Liquid PTC Conditions" *Tetrahedron* **1997**, *53*, 4787-4790.
17. Albanese, D.; Leone, M.; Penso, M.; Seminati, M.; Zenoni, M. "Catalytic Transfer Hydrogenolysis of 4-Nitrobenzyl Esters of Cephalosporins" *Tetrahedron Lett.* **1998**, *39*, 2405-2408.
18. Albanese, D.; Landini, D.; Penso, M "Hydrated Tetrabutylammonium Fluoride as a Powerful Nucleophilic Fluorinating Agent" *J. Org. Chem.* **1998**, *63*, 9587-9589.
19. Albanese, D.; Susan E. Gibson (née Thomas), Ellian Rahimian "Stereocontrolled Substitution of Benzylic Ethers Complexed to Tricarbonylchromium (0)" *Chem. Commun.* **1998**, 2571-2572.
20. Albanese, D.; Landini, D.; Maia, A.; Penso, M "Phase Transfer Catalysis (PTC): some recent applications in organic synthesis" *J. Mol. Catal. A* **1999**, *150/1-2*, 113-131.
21. Albanese, D.; Leone, M.; Penso, M.; Seminati, M.; Zenoni, M. "Synthesis and Activity of Cephalosporins Containing an oxyiminomethylene functionality in the *ortho*-Position of an Aromatic 7-Side Chain Substituent" *Il Farmaco* **1998**, *53*, 709-717.
22. Albanese, D.; Landini, D.; Penso, M; Petricci, S. "Homocoupling of Aryl Halides Promoted by Tetrabutylammonium Fluoride" *Synlett*, **1999**, 199-200.
23. Albanese, D.; Landini, D.; Penso, M; Petricci, S. "Synthesis of *N*-Sulfonyl Aziridines Through Regioselective opening of Epoxides Under Solid-Liquid PTC Conditions" *Tetrahedron* **1999**, *55*, 6387-6394.
24. Albanese, D.; Penso, M; Zenoni, M. "A Practical Synthesis of 4-Chloro-3-hydroxymethylpyridine by Regioselective One-Pot Lithiation/Formylation/Reduction of 4-Chloropyridine" *Synthesis* **1999**, 1294-5.
25. Albanese, D.; Landini, D.; Penso, M "Novel Concise Synthesis of 2-Substituted-3,4-Dihydro-2H-1,4-benzoxazines by Ring Opening of Glycidols under Solid-Liquid Phase Transfer Catalysis Conditions" *Chem. Comm.* **1999**, 2095-6.
26. Albanese, D.; Landini, D.; Lupi, V.; Penso, M. "N-Monoalkylation of α -Aminocarboxylic Esters under Solid Liquid Phase Transfer Catalysis Conditions" *Eur. J. Org. Chem.* **2000**, 1443-1449.
27. Albanese, D.; Landini, D; Penso, M. "A Practical Olefin Hydroboration under Liquid-Liquid Phase Transfer Catalysis Conditions" *Synlett* **2000**, 997-8.
28. Albanese, D.; Landini, D; Maia, A.; Penso, M. "Key Role of the Water in Phase Transfer Catalyzed Processes: A Mini-Review" *Ind. & Eng. Chem. Res.* **2001**, *40*, 2396-2401.

29. Albanese, D.; Landini, D.; Maia, A. "Dramatic Effect of the Metal Cation in Dealkylation Reactions of Phosphinic Esters Promoted by Complexes of Polyether Ligands with Metal Iodides" *J. Org. Chem.* **2001**, *66*, 3249-3252.
30. Albanese, D.; Landini, D.; Lupi, V.; Penso, M. "Stereo- and Regioselective Opening of 3-Phenylglycidates by Trifluoromethylsulfonamide under Heterogeneous Conditions" *Chemistry Letters*, **2001**, 400-401.
31. Albanese, D.; Landini, D.; Lupi, V.; Penso, M. "Synthesis of 2-substituted 3,4-dihydro-2*H*-1,4-benzoxazines in Water under Phase Transfer Catalysis Conditions" *Adv. Synth. Cat.* **2002**, *344*, 299-302.
32. Albanese, D. "Liquid-Liquid Phase Transfer Catalysis: Basic Principles And Synthetic Applications" in "Interfacial catalysis" Volkov ed. Marcel Dekker, New York, **2002**.
33. Albanese, D.; Benaglia, M.; Landini, D.; Maia, A.; Lupi, V.; Penso, M. "Use of a Quaternary Ammonium Salt Supported on Liposoluble PEG Matrix for laboratory and Industrial Synthetic Applications of Phase Transfer Catalysis (PTC)" *Ind. Eng. Chem. Res.* **2002**, *41*, 4928-4935.
34. Albanese, D.; Landini, D.; Lupi, V.; Penso, M. "Straightforward Synthesis of 2-Substituted 3,4-dihydro-2*H*-1,4-Benzoxazines under Solid-Liquid Phase Transfer Catalysis Conditions" *Ind. Eng. Chem. Res.* **2003**, *42*, 680-686.
35. Penso, M.; Albanese, D.; Landini, D.; Lupi, V.; "Biaryl formation: palladium catalyzed cross-coupling reactions between hypervalent silicon reagents and aryl halides" *J. Mol. Catal. A: Chem* **2003**, *204-205*, 177-185.
36. Albanese, D.; Donghi, A.; Landini, D.; Lupi, V.; Penso, M. "Environmentally Benign, Sequential Synthesis of 3,4-Dihydro-2*H*-1,4-benzoxazines Under Phase Transfer Catalysis Conditions" *Green Chem.* **2003**, *5*, 367-369.
37. Penso, M.; Albanese, D.; Landini, D.; Lupi, V.; Tricarico, G. Specific Solvation as a Tool for the N-Chemosselective Arylsulfonylation of Tyrosine and (4-Hydroxyphenyl)glycine Methyl Esters. *Eur. J. Org. Chem.* **2003**, 4513-4517.
38. Albanese, D. "Liquid-Liquid Phase Transfer Catalysis: Basic Principles And Synthetic Applications" *Catalysis Reviews* **2003**, *45*, 369-395.
39. Albanese, D. "Critical survey covering the year 2003: introduction and transformation of functional groups" Seminars in Organic Synthesis XXIX Scuola "A. Corbella" - Gargnano **2004**, 365-398.

40. Lupi, V.; Albanese, D.; Landini, D.; Scaletti, D.; Penso, M. "Synthesis of 2,6-disubstituted morpholines through regioselective oxiranes ring opening by tosylamide under PTC conditions" *Tetrahedron* **2004**, *60*, 11709.
41. Lupi, V.; Albanese, D.; Landini, D.; Scaletti, D.; Penso, M. "Synthesis of α -hydroxy- β -triflamido carboxylic esters through ring opening of alkoxy-carbonyl oxiranes" *Synthesis* **2005**, 1675-1681.
42. Albanese, D. "Phase Transfer Catalysis (PTC): a powerful tool for the organic synthesis" *Mini-reviews in Organic Chemistry* **2006**, *3*, 195-217.
43. Penso, M.; Albanese, D.; Landini, D.; Lupi, V.; Scaletti, D. "Chemoselective *N*-Alkylation of di-*N,O*-protected tyrosine through specific Oxy-anion solvation by non-hydrogen bonding donor solvents" *Synlett* **2006**, 741-745.
44. Albanese, D.; Salsa, M.; Landini, D.; Lupi, V.; Penso, M.; "Concise synthesis of 2,6-disubstituted morpholines by intramolecular cyclisation of epoxyalcohols" *Eur. J. Org. Chem.* **2007**, 2107-2113.
45. Albanese, D.; Landini, D.; Lupi, V.; Penso, M.; Scaletti, D. "Synthesis of 2-Substituted 3,4-Dihydro-2*H*-1,4-benzoxazines through (the) Ligandless Copper Promoted Cyclization of Hydroxysulfonamides" *J. Mol. Cat. A: Chemical* **2008**, *288*, 28-32, **2008**.
46. Albanese, D.; Ghidoli, C.; Zenoni, M. "Concise synthesis of vinylheterocycles through β -elimination under solventless phase transfer catalysis conditions" *Org. Process Res. Dev.*, **2008**, *12*, 736-739.
47. Domenico Albanese "Phase Transfer Catalysis" *Kirk-Othmer Encyclopedia of Chemical Technology on-line edition* **2008**, 15 luglio 2008.
48. D. Albanese, D.; E. Carlini; Foschi, F.; A. Tagliabue; Penso, M. "Practical Synthesis of enantiomerically Pure Morpholines" *Chimica oggi/Chemistry Today*, **2008**, *26*, 68-70.
49. M. Penso,* D. Albanese, D. Landini, V. Lupi, A. Tagliabue*, "Complementary Heterogeneous/Homogeneous Protocols for the Synthesis of Densely Functionalized Benzo[d]sultams: C-C Bond Formation by Intramolecular Nucleophilic Aromatic Fluorine Displacement" *J. Org. Chem.* **2008**, *73*, 6686-6690.
50. Penso, M.; Lupi, V.; Albanese, D.; Foschi, F.; D. Landini; A. Tagliabue "A straightforward synthesis of enantiopure 2,6-disubstituted morpholines by a regioselective *O*-protection/activation protocol" *Synlett* **2008**, *16*, 2451-2454.
51. Albanese, D.; Foschi, F.; Penso, M. "A Practical Approach to the Synthesis of Enantiomerically Pure 2,6-Disubstituted Morpholines Under Phase Transfer Catalysis Conditions" *Catalysis Today* **2009**, *140 (1-2)*, 100-104.

52. Gaggero, N.; Colonna, S.; Albanese, D.; Del Monte, F. "Stereoselective chemo-enzymatic approaches to the synthesis of C2-1,3-dithiane-1,3-dioxide" *Phosphorous, Sulfur and Silicon and the related elements* **2009**, 184 (5), 1332-1339.
53. Domenico Albanese,* Dario Landini, Michele Penso, Aaron Tagliabue and Emanuele Carlini "Concise Synthesis of C₂-Symmetrical 2,6-Disubstituted Morpholines by N → O Boc Migration under SL-PTC conditions" *Org. Process Res. Dev.* **2010**, 14, 705-711.
54. Villa, F.; Albanese, D.; Giussani, B.; Stewart, P.S.; Daffonchio, D.; Cappitelli, F. "Hindering biofilm formation with zosteric acid" *Biofouling* **2010**, 26, 739-752.
55. Federica Villa, Betsey Pitts, Philip S. Stewart, Barbara Giussani, Simone Roncoroni, Domenico Albanese, Carmen Giordano, Marta Tunesi, Francesca Cappitelli "Efficacy of zosteric acid sodium salt on the yeast biofilm model *Candida albicans*" *Microbial Ecology* **2011**, 62, 584-598 (IF 3.251, 2009).
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57. Gaggero, N.; Albanese Domenico Carlo Maria; Celentano, G.; Banfi, S., Aresi, A. "Stereoselective Thio-Michael Addition to Chalcones in Water Catalyzed by Bovine Serum Albumin" *Tetrahedron: Asymmetry* **2011**, 22, 1231-1233.
58. Angelamaria Maia, Dario Landini and Domenico C. Albanese "Cyanuric chloride-catalyzed Beckmann rearrangement of ketoximes in biodegradable ionic liquids" *Tetrahedron* **2012**, 68, 1947-1951.
59. Cappitelli, F.; Salvadori, O.; Albanese, D.; Villa, F.; Sorlini, C. "Cyanobacteria cause black staining of the National Museum of the American Indian Building (Washington, D.C., USA)" *Biofouling* **2012**, 28, 257-266.
60. Gaggero, N.; Albanese Domenico Carlo Maria (R)-BINOL-derived C₂-symmetric bis-sulfinates as efficient sulfinyl transfer agents in the synthesis of (tert-butyl)sulfoxides *Tetrahedron* **2012**, 68, 7129-7132.
61. Domenico C. M. Albanese and Nicoletta Gaggero "N-Heterocyclic carbene catalysis as a tool for gaining access to the 3,4-dihydropyran-2-one skeleton" *Eur. J. Org. Chem.* **2014**, 5631-5640.
62. N. Gaggero,* D. C. M. Albanese and D. Nava "A New Approach to 4,6-Disubstituted-3,4-dihydropyran-2-ones by Domino Michael Addition-Cyclization Reaction under PTC Conditions" *Tetrahedron*, **2014**, 70, 8744-8749.

63. Domenico C. M. Albanese and Nicoletta Gaggero “Albumin as a promiscuous biocatalyst in organic synthesis” *RSC Advances*, **2015**, 5, 10588-10598.
64. Domenico C. M. Albanese,* Francesca Foschi, Michele Penso “Sustainable Oxidations under Phase Transfer Catalysis Conditions” *Org. Proc. Res. Dev.* **2016**, 20, 129-139.
65. Domenico C. M. Albanese, Selene Brunialti and Dario Destro “Solventless Synthesis of Quaterphenyls and Terphenyls from Chalcones and Allylsulfones under Phase Transfer Catalysis Conditions” *Catalysts* **2016**, 6(9), 142- doi:10.3390/catal6090142. <http://www.mdpi.com/2073-4344/6/9/142>.
66. Francesca Foschi, Domenico Albanese, Ilir Pecnikaj, Aaron Tagliabue, and Michele Penso Regioselective O-Sulfonylation of N,N-Bis(2-hydroxyalkyl)tosylamides as a Synthetic Key Step to Enantiopure Morpholines *Org. Lett.* **2017**, 19, 70-73. DOI: 10.1021/acs.orglett.6b03342.
67. Nicoletta Gaggero, Domenico C. M. Albanese and Meng Fei “A practical synthesis of 2,3-dihydro-1,5-benzothiazepines” *Green Chemistry* **2017**, 19, 5703-5707.
68. Nicoletta Gaggero, Domenico C. M. Albanese “An Overview of the *N*-Heterocyclic Carbene-Catalyzed Aza-Benzoin Condensation Reaction” *Catalysts* **2018**, 8 (5), 181-191. [DOI: 10.3390/catal8050181](https://doi.org/10.3390/catal8050181).
69. **BREVETTI**
70. Albanese, D.; Zenoni, M. “Alogenoarilsolfonammidi aventi caratteristiche antitumorali” Brevetto it. 31/5/**2001**; A27039.
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