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Curriculum Vitae – Research Interests

Education

1966: Ph.D. Chemistry, University of Tennessee, USA

1961: M.S. Chemistry, Texas A and M University, USA

1957: Diploma in Chemistry, University of Thessaloniki, Greece

Employment

- Research Director at the National Hellenic Research Foundation, Institute of Organic and Pharmaceutical Chemistry (1994-2000)
- Head of Organometallic Chemistry Group, Centre for Organic Chemistry, National Hellenic Research Foundation (1968-1994)
- Acting Director of Organic Research (Lithium Corporation of America)
- Research Chemist (Oak Ridge National Laboratory, University of Tennessee)
- Research Chemist (Chemetron Corporation)
- Teaching Assistant (Texas A and M University)

Research Interests

- Organometallic chemistry of the Group 1 and 2 metals and preparation of new reagents for organic synthesis
- Organic physical chemistry (structure-activity relationships)
- NMR spectroscopy and particularly its application to the study of stable paramagnetic organic reaction intermediates
- Synthesis of new materials with useful magnetic, optical or biological properties

Collaborations

Within NHRF: Dr. M.N. Alexis, Dr. M.G. Papadopoulos, Dr. G. Skretas, Dr. G. Papavassiliou.

National: Prof. C.G. Biliaderis, University of Thessaloniki; Prof. C. Demetzos, Prof. G. Kokotos, University of Athens; Prof. Igglesi-Markopoulou, National Technical University of Athens; Prof. I. Smonou, University of Crete; Dr. A. Terzis, Dr. C. Paleos, Dr. D Tsiourvas, NCSR "Democritos".

International: Prof. D. Bethell, University of Liverpool (UK), Prof. W.J. Blau, Trinity College Dublin (Ireland); Prof. G. Cravotto, University of Torino (Italy); Prof. K. Jug, University of Hannover (Germany); Prof. J. McCleverty, University of Bristol (UK); Prof. J.M. Nunzi, CEA Saclay (France); Prof. A. Pietrzykowski, Warsaw University of Technology (Poland).

Other Activities

1. Management of European Research Network Projects: "*Simple and Mixed Metal Alkyls, Alkoxides and Amides in Synthesis and Catalysis and as Precursors for Ceramic and Polymeric Materials*" (Human Capital and Mobility Network), "*Design, Synthesis and Study of Novel Non-linear Optical Materials*" (Training and Mobility of Researchers Network), which were coordinated by the IOPC/NHRF.
2. Teaching activities: Seminars to secondary education teachers, (National Hellenic Research Foundation, May 1998). Post-Graduate course in organometallic chemistry (EURODESY project 2006-2010)
3. Participation in committees for the acquisition of scientific instruments and committees for the evaluation of research personnel.
4. Chairman, 10th FECHEM Conference on Organometallic Chemistry, September 1993, Crete.
5. Chairman, 20th International Conference on Organometallic Chemistry, July 2002, Corfu.

Research Activities

1. Study and use of Main Group alkoxides and organometallic compounds. The use of metal alkoxide additives can radically alter the reactivity of organometallic reagents and we have exploited these properties for the development of new reagents and synthetic methodologies.
2. Use of radical anions for the reductive cleavage of carbon-heteroatom bonds and the formation of novel organometallic reagents.
3. Design and synthesis of dendrimers with applications in biomedicine, materials science and environmental chemistry.

4. Development of synthetic procedures towards organometallic stilbene derivatives and their further elaboration. The aim is to prepare compounds with special optical properties or biological behaviour.
5. Correlations of thermochemical data with physical and chemical properties. Additive relationships.

Funded Projects

A. Scientist in Charge

1. Human Capital and Mobility (CHRX-CT93-0281): 1993 - 1997
Title: Simple and Mixed Metal Alkyls, Alkoxides and Amides in Synthesis and Catalysis and as Precursors for Ceramic and Polymeric Materials
Network involving groups from Greece, UK, Germany, Spain, France, Ireland and the Netherlands. The network was coordinated by the IOPC, NHRF.
2. Training and Mobility of Researchers (ERBFMRXCT 960047): 1996 - 2000
Title: Design, Synthesis and Study of Novel Non-linear Optical Materials
Network involving groups from Greece, UK, Germany, Sweden, France and Ireland. The network was coordinated by the IOPC, NHRF.
3. YPER 1997: 1999 - 2001
Title: Synthesis of compatible organic additives for the protection of coloured polyester fibres from photochemical bleaching.
Collaboration between NHRF, VIOCHROM.
4. EPET II-EKBAN 98/66: 1998 - 2001
Title: Development of new methods for the therapy and prognosis of hormone dependent neoplasia.
Collaboration between NHRF, University of Patras, University of Crete, RAFARM AEBE.
5. PENED 1999 (99ED 173): 2000 - 2001
Title: Monomeric and polymeric chiral micelles as microreactors for the production of technological useful materials.
Collaboration between NRCPS Democritos, NHRF, University of Athens.

B. Project Participation

6. Human Capital and Mobility (CHRX-CT93-0148): 1993 - 1996
Title: Conjugated Ladder-Type Oligomers and Polymers Containing Fused Six- and Five-Membered Rings.
Network involving groups from Greece, UK, Germany, Italy and Portugal.

7. Excellence in Research Centres overseen by the GSRT (EPAN 3.3.1): 2002 – 2005
Title: New approaches against neurogenerative diseases.

Publications

Patents

1. C.G. Screttas, U.S. Patent 3, 468, 970 (Sept. 1969). *Chemical Abstracts*, **71**, 123879s (1969)
"Method of Carrying out Telomerization Reactions".
2. C.G. Screttas, U.S. patent 3, 691, 174 (1972): Fr. 1, 585, 022 (Jan. 1970).
Chemical Abstracts, **73**, 130895p (1970)
"Attaching a Metal to an Alkyl Side-chain of Pyridine, Quinoline and Isoquinoline".
3. C.G. Screttas, Ger. Offen. 1, 959, 195 (June 1970) *Chemical Abstracts*, **73**, 46813c (1970)
"Telomers of Aromatics with Olefins Useful for Solvent-Resistant Coatings".
4. J.F. Eastham and C.G. Screttas, U.S. Patent 3, 534, 113 (Oct. 1970) *Chemical Abstracts*, **74**, 3723b (1970)
"Preparation of Alkylolithium Compounds by Metalation".
5. C.G. Screttas, U.S. Patent 3, 639, 380 (Feb. 1972) *Chemical Abstracts*, **76**, 141515c (1972)
"Preparation of Microcrystalline Waxes by Catalytic Telomerization of Ethylene".
6. K.H. Martin and C.G. Screttas, U.S. Patent 3, 576, 889 *Chemical Abstracts*, **74**, 140935m (1970)
"Ethyneylation of Ketones and Aldehydes to Obtain Alcohols".
7. C.G. Screttas, U.S. Patent 3, 378, 045 (1973) *Chemical Abstracts*, **80**, 70951m (1974)
"Preparation of Organolithium Compounds".
8. C.G. Screttas, U.S. Patent 3, 932, 545 (Jan. 1976) *Chemical Abstracts*, **85**, 33177w (1976)
"Alkali Metal-Containing Organometallic Products".

Theses

1. C.G. Screttas. Ph.D. Thesis, The University of Tennessee, Diss. Abstracts, 27, 1829 (1966)
"Base Catalysis of Formation and Lysis of the Lithium-Carbo Bond".

Peer reviewed publications

1. C.G. Screttas and A.F. Isbel, *J. Org. Chem.*, **1962**, 27, 2573
"Utilization of Organolithium Compounds for the Preparation of Tertiary

Phosphines, Phosphine Oxides and Phosphine Sulfides".

2. C.G. Screttas and J.F. Eastham, *J. Am. Chem. Soc.*, **1965**, *87*, 3276
"Alkyl-lithium-Amine Crystalline Complexes".
3. C.G. Screttas and J.F. Eastham, *J. Am. Chem. Soc.*, **1966**, *88*, 5668
"Solvent Effects in Organometallic Reactions. Kinetic Role of Base".
4. C.G. Screttas, J.F. Eastham and C.W. Kamienski, *Chimia*, **1970** *24*, 109
"Selective Side Chain Lithiation of Toluene and Methyl-Pyridines".
5. C.G. Screttas, *J. Chem. Soc. D.*, **1971**, 406
"Reaction of Butyl-lithium with Stable Free Radicals".
6. C.G. Screttas, *J. Chem. Soc. D.*, **1972**, 752
"Stoichiometry and Synthetic Utility of the Reaction of Alkyl Halides with Lithium Dihydronaphthylides".
7. C.G. Screttas, *J. Chem. Soc. D.*, **1972**, 869
"Metallation of Aryl Ethers by Lithium Arenes".
8. C.G. Screttas, *J. C. S. Perkin II*, **1974**, 745
"On the Mechanism of Ring Metallation of Aromatic Compounds. Metallation of Thiophene by Lithium and by Lithium Dihydroarylates".
9. C.G. Screttas, Unpublished Results, Reported by C.W. Kamienski, *Advances in Chemistry Series 130 American Chemical Society*, Washington D.C. **1974**, p.130
"Oligoaddition of Ethylene to Alkyl-lithium Reagents".
10. C.G. Screttas, *J. C. S. Perkin II*, **1974**, 165
"Amphielectronic Ionization of a π -Radical, a Basis for Correlating Radical with Nucleophilic and/or Electrophilic Reactivities".
11. C.G. Screttas and D.G. Georgiou, *Tetrahedron Lett.*, **1975**, 417
"Concentration and Substrate Dependent Reaction Mechanisms in the Metal Ketyl-Alkyl Halide System. Magnetochemical Zero-Order Kinetics as Evidence for Diamagnetic Reactive Species at High Ketyl Concentrations. Catalysis by Transition Metals".
12. M.Micha-Screttas and C.G. Screttas, *J. Org. Chem.*, **1977**, *42*, 1462
"Preparation of Alkyl Phenyl Sulfides by Electrophilically Catalyzed Displacement of Certain Nucleophiles by Thiophenoxy Group".
13. C.G. Screttas and C.T. Cazianis, *Tetrahedron*, **1978**, *34*, 933
"Mechanism of Meerwein-Ponndorf-Verley Type Reactions".
14. C.G. Screttas and M.Micha-Screttas, *J. Org. Chem.*, **1978**, *43*, 1064
"Hydrolithiation of α -Olefins by a Regiospecific Two-Step Process. Transformation of Alkyl Phenyl Sulfides to Alkyl-lithium Reagents".
15. C.G. Screttas, *J. Org. Chem.*, **1979**, *44*, 1471

- "Could Ionization Potentials of Free Radicals Serve as Alkyl Inductive Substituent Constants?".
16. C.G. Screttas and M. Micha-Screttas, *J. Org. Chem.*, **1979**, *44*, 713
"Markownikoff Two-Step Hydrolihiation of a-Olefins. Transformation of Secondary and Tertiary Alkyl Phenyl Sulfides to the Relevant Alkylolithium Reagents".
 17. C.G. Screttas, *J. Org. Chem.*, **1979**, *44*, 3322
"Correlation of Activation Energies with Taft's Alkyl Inductive Substituent Constant and its Implications to the Respective Steric Parameters. Dual Kinetic Parameter Relationships".
 18. C.G. Screttas, *J. Org. Chem.*, **1980**, *45*, 333
"Some Properties of Heterolytic Bond Dissociation Energies and their Use as Molecular Parameters for Rationalizing or Predicting Reactivity".
 19. C.G. Screttas, *J. Org. Chem.*, **1980**, *45*, 1620
"Equivalent or Alternative Forms of the Evans-Polanyi-Type Relations".
 20. C.G. Screttas and M. Micha-Screttas, *J. Org. Chem.*, **1981**, *46*, 993
"Structure of Radical Anions in Solution as Deduced from Paramagnetic Solvent Nuclear Magnetic Resonance Shift Measurements 1. Molar Paramagnetic Solvent Shifts as Molecular Parameters for Understanding in Ketyl Anion Solutions".
 21. C.T. Cazianis and C.G. Screttas, *Tetrahedron*, **1983**, *39*, 165
"Fluorenone Ketyl Anions Generated in Hydrocarbon Media by Phase Transfer Catalysis".
 22. C.G. Screttas and M. Micha-Screttas, *J. Org. Chem.*, **1982**, *47*, 3008
"Synthesis of Benzhydryl Ethers by a C-C Forming Reaction Using 2-Chloroethyl Ether. A Method for Attaching a Protected 2-Hydroxyethyl Group to a Benzylic Carbon".
 23. C.G. Screttas and M. Micha-Screttas, *J. Org. Chem.*, **1983**, *48*, 153
"Paramagnetic Solvent Nuclear Magnetic Resonance Shifts in Radical Anion Solutions 2. Some Cation Dependent Phenomena in Concentrated Solutions of Aromatic Hydrocarbon Radical".
 24. C.G. Screttas and M. Micha-Screttas, *J. C. S. Chem. Commun.*, **1982**, 1168
"Carbon-13 Contact Solvent Shifts in Radical Anion Solutions. Mechanism of Spin Density Transfer to Solvent".
 25. C.G. Screttas and M. Micha-Screttas, *J. Org. Chem.*, **1983**, *48*, 252
"Paramagnetic Solvent Nuclear Magnetic Resonance Shifts in Radical Anion Solutions 3. A Kinetic Method for Measuring Molar Paramagnetic Solvent Shifts of Unstable Radical Anions".
 26. C.G. Screttas and M. Micha-Screttas, *J. Phys. Chem.*, **1983**, *87*, 3844
"Paramagnetic Solvent NMR Shifts in Radical Anion Solutions. Carbon-13 Contact Shifts and Mechanism of Spin Density and/or Electron Transfer to Substrate".

27. C.G. Screttas and M. Micha-Screttas, *J. Organometal. Chem.*, **1983**, 252, 263
"Single-Titration Method for the Determination of Lithium Naphthalenide in Tetrahydrofuran".
28. C.G. Screttas, M. Micha-Screttas and C.T. Cazianis, *Tetrahedron Lett.*, **1983**, 24, 3287
"The Benzilic Ester Rearrangement. Evidence for a SET Pathway in the Benzilic Ester and / or Acid Rearrangement".
29. C.G. Screttas and M. Micha-Screttas, *Organometallics*, **1984**, 3, 904
"Hydrocarbon-Soluble Organoalkali-Metal Reagents. Preparation of Aryl Derivatives".
30. C.G. Screttas and G.A. Heropoulos, *Tetrahedron*, **1985**, 40, 5275
"A Question Concerning the pK Range within which an Organic Free Radical Exhibits Normal Radical Behaviour. The Case of Galvinoxyl".
31. C.G. Screttas and M. Micha-Screttas, *J. Organomet. Chem.*, **1985**, 290, 1
"The Diphenylmagnesium / Alkali Metal Alkoxide System. Hydrocarbon Soluble Organoalkali Metal Reagents".
32. C.G. Screttas and M. Micha-Screttas, *J. Organomet. Chem.*, **1985**, 292, 325
"Preparation of Solvated and/or Unsolvated Simple and Mixed Diarylmagnesiums".
33. C.G. Screttas and B.R. Steele, *J. Organomet. Chem.*, **1986**, 317, 137
"Formation of Ketones in the Reaction of Aldehydes with Unsolvated Dibutylmagnesium in Hydrocarbon Solvents under Homogeneous Conditions and its Implications".
34. C.G. Screttas and M. Micha-Screttas, *J. Organomet. Chem.*, **1986**, 316, 1
"Hexane-Soluble Complexes of Alkyl- and Alkenyl-Sodium Compounds with Magnesium Alkoxides".
35. C.G. Screttas and M. Micha-Screttas, *J. Am. Chem. Soc.*, **1987**, 109, 7573
"Radical Anions in Hydrocarbon Media. Interaction between Unsolvated and/or Solvated Radical Anions and Metal Alkoxides. Evidence for Cation-Dependent Clustering of Ketyl Anions at High Concentrations".
36. C.G. Screttas and I.C. Smonou, *J. Org. Chem.*, **1988**, 53, 893
"Ring Size Dependent Orientation in Dehydration of 1-[(Ethoxycarbonyl) methyl]-cycloalkanols".
37. C.G. Screttas and I.C. Smonou, *J. Organomet. Chem.*, **1988**, 342, 143
"Preparation of Allylic Lithium Reagents with the Allylic System Partly Incorporated into Carbocyclic Rings".
38. C.G. Screttas and B.R. Steele, *J. Org. Chem.*, **1988**, 53, 5151
"Carboxamidation of Organolithium and Organomagnesium Reagents by a Two-Step One-Flask Reaction. Promotion by Magnesium Alkoxides".
39. C.G. Screttas and B.R. Steele, *J. Org. Chem.*, **1989**, 54, 1013

- "Metal Alkoxide Modified Organometallic Reagents. The Preparation and Stability of Organolithium Reagents in Tetrahydrofuran in the Presence of Magnesium 2-Ethoxy-ethoxide".
40. C.G. Screttas and M. Micha-Screttas, *J. Org. Chem.*, **1989**, *54*, 5132
"Correlation of Thermochemical Data with Gas Phase Ionization Potentials".
 41. C.G. Screttas and G.A. Heropoulos, *Magn. Res. Chem.*, **1990**, *28*, 878
"Molar Paramagnetic Solvent NMR Shifts of Galvinoxyl in Toluene. Kinetics of the Reaction Between Galvinoxyl and Tertiary Amines at High Radical Concentrations".
 42. 52. C.G. Screttas and M. Micha-Screttas, *J. Org. Chem.*, **1991**, *56*, 1615
"Some Properties and Trends of Enthalpies of Vaporization and of Trouton's Ratios of Organic Compounds. Correlation of Enthalpies of Vaporization and of Enthalpies of Formation with Normal Boiling Points".
 43. C.G. Screttas and M. Micha-Screttas, *Bull. Soc. Chim. Belg. (Europ. Section)*, **1991**, *100*, 199
"Spectroscopic Electronegativities of Halogens and Interhalogens Are Transferable and Additive Parameters. Examples of Correlations with Thermochemical and Nuclear Magnetic Resonance Spectroscopic Data".
 44. C.G. Screttas and G.A. Heropoulos, *J. Polymer Chem., Section A*, **1992**, *30*, 1771
"Kinetic-Thermodynamic Evidence for the Involvement of SET steps in the Anionic Polymerization of Styrenes."
 45. C.G. Screttas and G.A. Heropoulos, *J. Org. Chem.*, **1993**, *58*, 1794
"Spectroscopic Electronegativities of Alkyl Groups. A Method for Estimating Ionization Potentials of Di- and Triradicals".
 46. C.G. Screttas and G.A. Heropoulos, *J. Org. Chem.*, **1993**, *58*, 3654
"Transferability-Additivity of Molar Volumes of Organic Liquids and their Relation to Normal Boiling Points".
 47. C.G. Screttas and B.R. Steele, *J. Organometal. Chem.*, **1993**, *453*, 163
"Activated Alkyl- and Allyl-alkali Metal Reagents: Contrasting Behaviour towards Ethylene".
 48. C.G. Screttas and G.A. Heropoulos, *J. Mol. Struct.*, **1994**, *303*, 149
"Correlating Thermochemical Data with Molar Volumes. Toward Defining Chemical Space".
 49. C.G. Screttas, G.I. Ioannou and D.G. Georgiou, *Russ. Chem. Bull.*, **1995**, *1*, 83
"Stoichiometry and Mechanism of Diphenyl Ketyl Alkali Metal Protonation by Weak Proton Donors and their Relevance to the Base-Catalyzed Decomposition of Benzopinacol
 50. C.G. Screttas, G.I. Ioannou and M. Micha-Screttas, *J. Organometal. Chem.*, **1996**, *511*, 217

- "Stoichiometry of Protonation of Aromatic Hydrocarbon Radical Anions by Weak Proton Donors. A Marked Discrepancy Between the Number of Protons Used and those Incorporated into the Aromatic Structure"
51. C.G. Screttas, G.A. Heropoulos and B.R. Steele, *J.C.S. Faraday Trans.*, **1996**, 1717
"Deviation from Trouton's Rule and a Method for Converting a Non-constitutive Molecular Parameter into a Constitutive One".
 52. C.G. Screttas, M. Micha-Screttas and B.R. Steele, *J. Organomet. Chem.*, **1997**, 536-7, 149
"The tert-Butyl Chloride-lithium Naphthalene Radical Anion and tert-Butyllithium-S. Mechanism of Metallation"
 53. I.D. Kostas and C.G. Screttas, *J. Org. Chem.*, 1997, 62, 5575
"Synthesis and Applications of Tetrahydrofuran -Stable Substituted 3- (Lithioxyalkyl)- and 4-(Lithioxyalkyl)lithiums, Modified with Magnesium 2-Ethoxyethoxide"
 54. I.D. Kostas, C.G. Screttas, C.P. Raptopoulou and A. Terzis, *Tetrahedron Lett.*, **1997**, 38, 8761
"A Remarkable Tendency of *o*-Lithio-N-(2lithioxyethyl)-N-methyl-aniline to Form Heterocyclic Derivatives by its Reaction with Dichlorodialkylsilanes or Silicon Tetrachloride. Synthesis of 2,5,1-Benzoxazasilepines and of the Silaspiro Analogue".
 55. I.D. Kostas and C.G. Screttas, *Main Group Metal Chem.*, **1997**, 20, 787
"Synthesis of Tetrahydrofuran-Stable ω -Lithioxy-Azaalkyllithiums".
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"Synthesis of new phosphinoaminoalcohol ligands via ortho-alkyllithiation reactions. Versatile coordination behaviour towards Cu(I) and Pd(II)."
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"Phosphorus-31 contact shifts as a measure of weak ligand affinities. Interaction between alkali metal fluorenone radical anions and certain phosphorus (III and V) ligands."
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"Magnetic and electrochemical investigations on anions derived from oligoketones containing fluorenone and benzophenone units. An approach to the design of stable multiradical organic materials."
 59. I.D. Kostas and C.G. Screttas, *J. Organomet. Chem.* **1999**, 585, 1-6.
"New rhodium complexes with P,N-ligands possessing a hydroxy or methoxy group. Synthesis, characterization and application to hydroformylation of styrene"
 60. C.S. Salteris, I.D. Kostas, M. Micha-Screttas, G.A. Heropoulos, C.G. Screttas and A. Terzis, *Main Group Met. Chem.* **1999**, 22, 427-434.

- "ortho-directed lithiation of omega-phenoxyalkanethiols and N,N-dimethyl-omega-phenoxyalkylamines. Crystal structure of bis[o-[(2-dimethylamino)ethoxy]phenyl]-mercury"
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62. C.S. Salteris, I.D. Kostas, M. Micha-Screttas, B.R. Steele, G.A. Heropoulos, C.G. Screttas and A. Terzis *J. Organomet. Chem.*, **1999**, *590*, 63-70.
"Synthesis of lithium ω -(m- and p-lithiophenoxy)alkoxides modified with magnesium 2-ethoxyethoxide. Crystal structures of bis[4-(2-hydroxyethoxy)phenyl]mercury and bis[4-(3-hydroxypropoxy)phenyl]mercury"
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65. B.R. Steele and C.G. Screttas, *J. Am. Chem. Soc.* **2000**, *122*, 2391-2392.
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