

CONSTANTINOS G. VAYENAS

Curriculum Vitae

Professor, University of Patras

Member, Academy of Athens, Chair of Chemical Sciences

Editor, Modern Aspects of Electrochemistry

Born: September 22, 1950 in Athens, Greece

Current address: Laboratory of Chemical & Electrochemical Processes (LCEP), Dept. of Chemical Engineering, 1, Caratheodory St., University of Patras, GR-26504 Patras, Greece,
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Education:

Diploma in Chemical Engineering, NTU Athens, 1973

PhD, University of Rochester, 1977

Professional Experience:

Teaching and Research Assistant, University of Rochester, 9/1/73-9/1/76
Assistant Professor of Engineering and Applied Science, Yale University, 9/1/76-9/1/77
Assistant Professor of Chemical Engineering, M.I.T., 9/1/77-9/1/78
Dupont Assistant Professor of Chemical Engineering, M.I.T., 9/1/78-6/1/80
J.R. Mares Assistant Professor of Chemical Engineering, M.I.T., 6/1/80-6/1/81
Associate Professor of Chemical Engineering, M.I.T. 6/1/81-6/1/83
Professor of Chemical Engineering, University of Patras, Greece, 1981-present
Alexander von Humboldt Fellow, University of Karlsruhe, 1991
Visiting Professor, Yale University, 1991-92
Invited Professor, EPFL, Lausanne, 1994
Invited Professor, Université de Lyon, 2007

Administrative Experience:

Dean of Engineering, University of Patras, 1983-85
Chairman of Chemical Engineering, University of Patras 1986-89 and 1993-95
Vice-President of DIKATSA (Hellenic Bureau for recognizing the equivalence of foreign academic degrees), 1988-89
Vice-Director, ICE/HT, 1985-87 & 1989-91
Vice-President, National Hellenic Research Foundation, EIE, 1994-1995
President, National Hellenic Research Foundation, 1995-1996
President of the Hellenic Catalysis Society, 1993-1995
Vice-Rector, University of Patras, 1997-2003
Member of the European Science and Technology Assembly (ESTA), 1997-2000
Secretary and Treasurer of the International Society for Solid State Ionics, 1998-2000
Member and Vice President of the National Research Council of Greece, 2001-2004
Chairman of Division 5, ISE, 2007
Member, Academy of Athens, Chair of Chemical Sciences, 2010 -

Research Interests:

Electrochemistry, electrocatalysis, heterogeneous catalysis, promotion, electrochemical promotion of catalysis, fuel cells, chemical cogeneration in fuel cells, chemical and electrochemical kinetics and reaction engineering, physical chemistry, proton tunnelling, mathematical modelling of chemical and physical systems.

Main Awards/Honors:

Member of the Academy of Athens, 2010 -
Fellow of the International Society of Electrochemistry (ISE) 2005
Outstanding achievement Award of the High Temperature Division of the Electrochemical Society, 1996
Empirikion Foundation Award in Chemistry, 1994
Academy of Athens Award in Chemistry, 1992
Wason Medal for Materials Research, American Concrete Institute, 1992
Alexander von Humboldt Fellowship, 1990
B.F. Dodge Lecture, Yale University, 1989, 2005
H. and C. Dreyfus Teacher-Scholar Award, 1981
Outstanding Faculty Award, Dept. of Chemical Engineering, M.I.T. 1979 & 1981
E.H. Hooker Fellowship, University of Rochester, 1975
Greek State Prize for highest average in the National Technical University, 1972
Greek State Fellowship, (IKY) 1969-73
Greek State Fellowship (IKY) for 2nd highest average in the entrance examination of the National Technical University, 1st in Chemical Engineering, 1968
Praise of the Hellenic Mathematics Association, 1968

Editorships:

Modern Aspects of Electrochemistry, 2001-
Ionics, Associate Editor, 1999-2004
Solid State Ionics, Guest Editor, 1999-2000
Topics in Catalysis, Guest Editor, 2006-2007
Journal of Applied Electrochemistry, Guest Editor, 2007
Catalysis Today, Guest Editor, 2009

Memberships of Editorial Boards:

Topics in Catalysis
Catalysis Letters
Ionics
Journal of New Materials for Electrochemical Systems
Chemical Industry
ChemElectroChem

Organization of International Conferences:

Member of the organizing or advisory committee of:

1st Panhellenic Catalysis Symposium, Patras 1987
2nd Panhellenic Catalysis Symposium, Patras 1989
2nd International Conference on Solid Oxide Fuel Cells, Athens, 1991, Conference co-Chairman
1st International Conference on Electrocatalysis, Ferrara 1993
1st Euroconference on Solid State Ionics, Zakynthos 1994
2nd Euroconference on Solid State Ionics, Portugal 1995
4th Panhellenic Catalysis Symposium, Papingo 1995
3rd Euroconference on Solid State Ionics, Sardinia 1996
192nd Annual Meeting of the Electrochemical Society, Paris, 1997
4th International Conference on Spillover, Dalian, China, 1997
3rd World Congress on Oxidation Catalysis, San Diego, USA, 1997
12th International Conference on Solid State Ionics, Chalkidiki, Greece, 1999, Conference Chairman
50th International Society of Electrochemistry, (ISE) Meeting, Pavia, Italy, 1999
3rd International Symposium on Electrocatalysis, Portoroz, Slovenia, 2000
12th International Congress on Catalysis, Granada, Spain, 2000
55th International Society of Electrochemistry (ISE) Meeting Thessaloniki, 2004
19th North American Catalysis Conference, Philadelphia, 2005

Funded Research: ~5,800,000 Euro

Refereed Publications in Journals: 234 (of which 4 in Science and Nature)

Books authored: 3, including “*Electrochemical Activation of Catalysis: Promotion, Electrochemical Promotion and Metal-Support Interactions*” C.G. Vayenas, S. Bebelis, C. Pliangos, S. Brosda, and D. Tsiplakides, Kluwer/Plenum Press, New York (2001).

Books edited: 8, including “*Catalysis and Electrocatalysis at Nanoparticles Surfaces*” (A. Wieckowski, E. Savinova & C.G. Vayenas, eds.), Marcel Dekker Inc., New York - Basel (2003).

Chapters in Books: 12

International Patents: 12

Citations by others: ~ 4235 (22.01.2013, ISI Web of Science)

Invited Seminars in Universities and Research Centers: 105

Plenary, Keynote, Award and Invited Lectures in International Conferences: 53

PhD students supervised: 34 (12 in Academia)

PUBLICATIONS

A. IN REFEREED JOURNALS

1979

- J1.** “Chemistry at Catalyst Surfaces: The Oxidation of SO₂ on noble metals”, C.G. Vayenas and H.M. Saltsburg, *J. Catal.* **57**, 296-314 (1979)

1980

- J2.** “Solid Electrolyte Aided Study of the Oxidation of Ethylene Oxide on Silver”, M. Stoukides and C.G. Vayenas, *J. Catal.* **64**, 18-28 (1980)
- J3.** “Kinetics, Limit Cycles and Mechanism of Ethylene Oxidation on Pt”, C.G. Vayenas, B. Lee and J. Michaels, *J. Catal.* **66**, 36-48 (1980)
- J4.** “Cogeneration of Electric Energy and Nitric Oxide”, C.G. Vayenas and R.D. Farr, *Science* **208**, 593-595 (1980)
- J5.** “Ammonia High Temperature Solid Electrolyte Fuel Cell”, R.D. Farr and C.G. Vayenas, *J. Electrochem. Soc.* **127**, 1478-1483 (1980)

1981

- J6.** “The role of PtO_x in the isothermal rate and oxygen activity oscillations of the Ethylene Oxidation on Pt”, C.G. Vayenas, C.Georgakis, J. Michaels and J. Tormo, *J. Catal.* **67**, 348-361 (1981)
- J7.** “Solid Electrolyte-Aided Study of the Ethylene Oxidation on Polycrystalline Silver”, M. Stoukides and C.G. Vayenas, *J. Catal.* **69**, 18-31 (1981)
- J8.** “The effect of Electrochemical Oxygen Pumping on the Rate and Selectivity of Ethylene Oxidation on Polycrystalline Silver”, M. Stoukides and C.G. Vayenas, *J. Catal.* **70**, 137-146 (1981)
- J9.** “The effect of Homogeneous Gas Phase Oxidations in Char Particle Gasification”, R. Cwiklinski, C.G. Vayenas, C. Georgakis and J. Wei, *Chem. Eng. Science* **36 (12)**, 1883-1896 (1981)
- J10.** “Ammonia Oxidation to Nitric Oxide in a Solid Electrolyte Fuel Cell”, C. Sigal and C.G. Vayenas, *Solid State Ionics* **5**, 567-570 (1981)

1982

- J11.** “Kinetics and Rate Oscillations of the oxidation of Propylene Oxide on Silver”, M. Stoukides and C.G. Vayenas, *J. Catal.* **74**, 266-274 (1982)
- J12.** “Response to Comments on the Model of Isothermal Oscillations of Ethylene Oxidation on Pt”, C.G. Vayenas, C. Georgakis, and J.Michaels, *J. Catal.* **73**, 201-204 (1982)
- J13.** “On the Stability Limit of Surface Platinum Oxide and its role in the oscillatory behavior of Platinum Catalyzed Oxidations”, C.G.Vayenas and J. Michaels, *Surface Science* **120**, L405-L408 (1982)

1983

- J14.** “Steady State Analysis of High Temperature Fuel Cells”, P.G. Debenedetti and C.G.Vayenas, *Chem. Engin. Sci.* **38(11)**, 1817-1829 (1983)
- J15.** “Solid Electrolyte Aided-Study of Propylene Oxidation on Polycrystalline Silver”, M. Stoukides and C.G. Vayenas, *J. Catal.* **82**, 45-55 (1983)

1984

- J16.** “Electrocatalytic Rate Enhancement of Propylene Epoxidation on Porous Silver Electrodes Using a Zirconia Oxygen Pump”, M. Stoukides and C.G. Vayenas, *J. Electrochem. Soc.* **131(4)**, 839-845 (1984)

- J17.** “Kinetics of Vapor-Phase Electrochemical Oxidative Dehydrogenation of Ethylbenzene”, J.N. Michaels and C.G. Vayenas, *J. Catalysis* **85**, 477-487 (1984)
- J18.** “Styrene Production from Ethylbenzene on Platinum in a zirconia Electrochemical Reactor”, J.N. Michaels and C.G. Vayenas, *J. Electrochem. Soc.* **131**(11), 2544-2550 (1984)
- J19.** “Comment on the “Interpretation of the Electromotive Forces of Solid Electrolyte Concentration Cells during CO oxidation on Platinum” and on “Electromotive-Forces Studies of CO oxidation on Platinum”, C.G. Vayenas, *J. Catalysis* **90**, 371-373 (1984)
- 1985**
- J20.** “Cross-Flow Solid-State Electrochemical Reactors: A steady-state Analysis”, C.G. Vayenas, P.G. Debenedetti, Y. Yentekakis and L.L. Hegedus, *Ind. & Eng. Chem. Fundamentals* **24**, 316-324 (1985)
- 1986**
- J21.** “Optimal Residence Time Distribution for Product Yield Maximization in Chemical Reactors”, V. Nestoridis, I. Andreou and C.G. Vayenas, *J. of Optimization Theory and Applications (JOTA)* **49**(2), 271-287 (1986)
- J22.** “A Novel Cross-Flow Design for Solid State Electrochemical Reactors”, J.N. Michaels, C.G. Vayenas and L.L. Hegedus, *J. Electrochem. Soc.* **133**(3), 522-525 (1986)
- 1987**
- J23.** “Effectiveness Factors for reactions between volatile and non-volatile components in partially wetted catalysts”, I. Yentekakis and C.G. Vayenas, *Chem. Engng. Science* **42**(6), 1323-1332 (1987)
- J24.** “Optimal Catalyst Distribution and Generalized Effectiveness Factors in Pellets: Single Reactions with Arbitrary kinetics”, C.G. Vayenas and S. Pavlou, *Chem. Engng. Science* **42**(11), 2633-2645 (1987)
- J25.** “Optimal Catalyst Distribution for Selectivity Maximization in Pellets: Parallel and Consecutive Reactions”, C.G. Vayenas and S. Pavlou, *Chem. Engng. Science* **42**(7), 1655-1666 (1987)
- J26.** “Optimal Catalyst Distribution in Pellets with Shell Progressive Poisoning”, T. Bacaros, S. Bebelis, S. Pavlou and C.G. Vayenas in “Catalyst Deactivation 1987”, P. Delmon, G.F. Froment (eds) “Studies in Surface Science and Catalysis”, Elsevier, Amsterdam, **34**, 459-468 (1987)
- 1988**
- J27.** “Optimal Catalyst Distribution for Selectivity Maximization in Nonisothermal Pellets: The case of Parallel Reactions”, C.G. Vayenas and S. Pavlou, *Chem. Engng. Science* **43**(10), 2729-2740 (1988)
- J28.** “Solid Electrolyte Aided Study of the Mechanism of CO oxidation on Polycrystalline Platinum”, I.V. Yentekakis, S. Neophytides and C.G. Vayenas, *J. Catalysis* **111**, 152-169 (1988)
- J29.** “The Effect of Electrochemical O²⁻ Pumping on the Steady State and Oscillatory Behavior of CO oxidation on Polycrystalline Pt”, I.V. Yentekakis and C.G. Vayenas, *J. Catalysis* **111**, 170-188 (1988)
- J30.** “Catalytic and Electrocatalytic Reactions in Solid Oxide Fuel Cells”, C.G. Vayenas, *Solid State Ionics*, Review Paper, **28-30**, 1521-1539 (1988)
- J31.** “Non-Faradaic Electrochemical Modification of Catalytic Activity”, C.G. Vayenas, S. Bebelis and S. Neophytides, *J. Phys. Chem.* **92**, 5083-5085 (1988)
- J32.** “Mathematical Modelling of SLC Precalciners”, S. Kolifetis and C.G. Vayenas, *ZKG (Zement-Kalk-Gypsum) International* **41**(11), 559-563 (1988)

1989

- J33.** “Optimal Catalyst Distribution for Selectivity Maximization in Nonisothermal Pellets: The Case of Consecutive Reactions”, C.G. Vayenas, S. Pavlou and A. Pappas, *Chem. Engng. Science* **44**(1), 133-145 (1989)
- J34.** “Non-Faradaic Electrochemical Modification of Catalytic Activity: 1. The case of Ethylene Oxidation on Pt”, S. Bebelis and C.G. Vayenas, *J. Catalysis* **118**, 125-146 (1989)
- J35.** “Non-Faradaic Electrochemical Modification of Catalytic Activity: 2. The case of Methanol Dehydrogenation and Decomposition on Ag”, S. Neophytides and C.G. Vayenas, *J. Catalysis* **118**, 147-163 (1989)
- J36.** “Chemical Cogeneration in Solid Oxide Fuel Cells: The Oxidation of H₂S to SO₂”, I.V. Yentekakis and C.G. Vayenas, *J. Electrochem. Soc.* **136**, 996-1002 (1989)
- J37.** “Feste Ionenleiter in der Heterogene Katalyse”, H.-G. Lintz and C.G. Vayenas, (review paper) *Angewandte Chemie* **101**(6), 725-732 (1989)
- J38.** “Solid Ion Conductors in Heterogeneous Catalysis”, H.-G. Lintz and C.G. Vayenas (review paper) *Angewandte Chemie Intern. Ed. in Engl.* **28**(6), 708-715 (1989)
- J39.** “In Situ High Temperature SERS on Ag Catalysts and Electrodes during Ethylene Epoxidation”, S. Boghosian, S. Bebelis, C.G. Vayenas and G.N. Papatheodorou, *J. Catal.* **117**, 561-565 (1989)
- J40.** “Non-Faradaic Electrochemical Modification of Catalytic Activity in Solid Electrolyte Cells”, C.G. Vayenas, S. Bebelis, S. Neophytides and I.V. Yentekakis, *Applied Physics (A)* **49**, 95-103 (1989)
- J41.** “A Reaction Engineering Approach to the Problem of Concrete Carbonation”, V. Papadakis, C.G. Vayenas and M.N. Fardis, *AIChE J.* **35**(10), 1639-1650 (1989)

1990

- J42.** “Chemical Cogeneration in Solid Electrolyte Cells: The Oxidation of CH₃OH to H₂CO”, S. Neophytides and C.G. Vayenas, *J. Electrochem. Soc.* **137**(3), 839-845 (1990)
- J43.** “Optimal Catalyst Activity Profile in pellets with Shell-progressive Poisoning: The case of fast linear kinetics”, S. Pavlou and C.G. Vayenas, *Chem. Engng. Science* **45**(3), 695-703 (1990)
- J44.** “Optimal Catalyst Activity Distribution for Selectivity Maximization in Triangular Reaction Networks: Application to the cases of Oxidative Coupling of CH₄ and Epoxidation of C₂H₄”, S. Pavlou and C.G. Vayenas, *J. Catal.* **122**, 389-405 (1990)
- J45.** “The Dependence of Catalytic Activity on Catalyst Work Function”, C.G. Vayenas, S. Bebelis and S. Ladas, *Nature* **343**, 625-627 (1990)
- J46.** “Non-Faradaic Electrochemical Modification of Catalytic Activity on Pt Metals” C.G. Vayenas, S. Bebelis, I.V. Yentekakis, P. Tsiakaras and H. Karasali, *Plat. Met. Rev.* **34**(3), 122-130 (1990)
- J47.** “Non-Faradaic Electrochemical Modification of Catalytic Activity: Partial Oxidation of C₂H₄ on Ag and CH₃OH on Pt”, C.G. Vayenas, S. Bebelis and S. Neophytides in “New Developments in Selective Oxidation” G. Centi and F. Trifiro Ed., “*Studies in Surface Science and Catalysis*” **55**, pp. 643-652, Elsevier, Amsterdam (1990)

1991

- J48.** “Non-Faradaic Electrochemical Modification of Catalytic Activity: 3. The Case of Methanol Oxidation on Pt”, C.G. Vayenas and S. Neophytides, *J. Catalysis* **127**, 645-664 (1991)
- J49.** “Physical and Chemical Characteristics Affecting the Durability of Concretes”, V.G. Papadakis, M.N. Fardis and C.G. Vayenas, *ACI Materials J.* **88**(2), 186-196 (1991)
- J50.** “Experimental investigation and Mathematical modeling of the concrete carbonation problem”, V.G. Papadakis, C.G. Vayenas and M.N. Fardis, *Chem. Engng. Sci.* **46** (5/6), 1333-1338 (1991)

- J51.** “Oxidative Coupling of Methane over Yttria-doped Zirconia Solid Electrolyte”, S. Seimanides, P. Tsiakaras, X.E. Verykios and C.G. Vayenas, *Appl. Catalysis* **68**, 41-53 (1991)
- J52.** “Fundamental Modeling and Experimental Investigation of Concrete Carbonation”, V. Papadakis, C.G. Vayenas and M.N. Fardis, *ACI Materials J.* **88**(4), 363-373 (1991)
- J53.** “Non-Faradaic Electrochemical Modification of Catalytic Activity: 4. The use of β'' -Al₂O₃ as the solid electrolyte”, C.G. Vayenas, S. Bebelis and S. Despotopoulou, *J. Catalysis* **128**, 415-435 (1991)
- J54.** “Solid Electrolyte Cyclic Voltammetry for in situ Investigation of Catalyst Surfaces”, C.G. Vayenas, A. Ioannides and S. Bebelis, *J. Catalysis* **129**, 67-87 (1991)
- J55.** “Solid Electrolytes and Catalysis. Part 1: Chemical Cogeneration”, C.G. Vayenas, S. Bebelis and C. Kyriazis, *Chemtech* **21**, 422-428 (1991)
- J56.** “Solid Electrolytes and Catalysis. Part 2: Non-Faradaic Catalysis”, C.G. Vayenas, S. Bebelis and C. Kyriazis, *Chemtech* **21**, 500-505 (1991)
- J57.** “Comment on the “Optimal catalyst activity profiles in pellets-VIII. General nonisothermal reacting systems with arbitrary kinetics”, S. Pavlou, C.G. Vayenas and G. Dassios, *Chem. Eng. Science* **46**(12), 3327-3328 (1991)
- J58.** “Work Function Measurements on Catalyst Films subject to in-situ Electrochemical Promotion”, S. Ladas, S. Bebelis and C.G. Vayenas, *Surface Science* **251/252**, 1062-1069 (1991)
- J59.** “Solid Electrolytes for in situ Promotion of Catalyst Surfaces: The NEMCA effect”, C.G. Vayenas, S. Bebelis, I.V. Yentekakis, P. Tsiakaras, H. Karasali and Ch. Karavasilis, *ISSI Letters* **2**, 5-7 (1991)
- J60.** “Kinetics of sulfation of Limestone and precalcined Limestone”, D. Spartinos and C.G. Vayenas, *Chem. Eng. and Process.* **30**, 97-106 (1991)
- J61.** “Catalytic and Electrocatalytic Reactions in Solid Electrolyte Cells: The NEMCA effect” C.G. Vayenas, S. Bebelis, I.V. Yentekakis, P. Tsiakaras, H. Karasali and Ch. Karavasilis, *Materials Science Forum* **76**, 141-148 (1991)
- J62.** “Work Function Measurements in Solid Electrolyte Cells: Dependence of Electrode Work Function on Electrode Potential and Polarization”. S. Bebelis and C.G. Vayenas, *Materials Science Forum* **76**, 221-224 (1991)
- J63.** “NEMCA: The Oxidation of CO on Pt”, H. Karasali and C.G. Vayenas, *Materials Science Forum* **76**, 171-174 (1991)
- J64.** “NEMCA: The Oxidation of CO on Ag”, Ch. Karavasilis, S. Bebelis and C.G. Vayenas, *Materials Science Forum* **76**, 175-178 (1991)
- J65.** “NEMCA: Methane oxidation on Pt”, P. Tsiakaras and C.G. Vayenas, *Materials Science Forum* **76**, 179-182 (1991)
- 1992**
- J66.** “Non-Faradaic Electrochemical Modification of Catalytic Activity: A Status Report” (Review Paper) C.G. Vayenas, S. Bebelis, I.V. Yentekakis and H.-G. Lintz, *Catalysis Today* **11**(3), 303-442 (1992)
- J67.** “Effect of Composition, Environmental Factors and cement line mortar coating, on Concrete Carbonation”, V.G. Papadakis, M.N. Fardis and C.G. Vayenas, *J. Materials and Structures* **25**, 293-304 (1992)
- J68.** “Hydration and Carbonation of Pozzolan Cements”, V.G. Papadakis, M.N. Fardis and C.G. Vayenas, *ACI Materials J.* **89**(3/4), 119-130 (1992)
- J69.** “Non-Faradaic Electrochemical Modification of Catalytic Activity: The Work Function of Electrodes in Solid Electrolyte Cells”, C.G. Vayenas, S. Bebelis, I.V. Yentekakis and S. Neophytides, *Solid State Ionics* **53-56**, 97-110 (1992)
- J70.** “Non-Faradaic Electrochemical Modification of Catalytic Activity: 5. Oxygen Chemisorption on Silver”, S. Bebelis and C.G. Vayenas, *J. Catal.* **138**, 570-587 (1992)

- J71.** “Non-Faradaic Electrochemical Modification of Catalytic Activity: 6. The epoxidation of Ethylene on Ag/ZrO₂(8mol%)Y₂O₃” S. Bebelis and C.G. Vayenas, *J. Catal.* **138**, 588-610 (1992)
- 1993**
- J72.** “Non-Faradaic Electrochemical Modification of Catalytic Activity: 7. The oxidation of CH₄ on Pt” P. Tsiakaras and C.G. Vayenas, *J. Catalysis* **140**, 53-70 (1993)
- J73.** “Oxidative Coupling of CH₄ on Ag catalyst-electrodes deposited on ZrO₂(8mol% Y₂O₃)”, P. Tsiakaras and C.G. Vayenas, *J. Catalysis* **144**, 333-347 (1993)
- J74.** “Electrochemical Modification of CH₃OH oxidation selectivity and activity on a Pt single-pellet catalytic reactor”, C. Cavalca, G. Larsen, C.G. Vayenas and G. Haller, *J. Phys. Chem.* **97**, 6115-6119 (1993)
- J75.** “In situ High Temperature SERS study of Oxygen adsorbed on Ag: Support and Electrochemical Promotion Effects”, D.I. Kondarides, G.N. Papatheodorou, C.G. Vayenas and X.E. Verykios, *Ber. Bunsenges. Phys. Chem.* **97**, 709-720 (1993)
- J76.** “Solid electrolytes for in situ promotion of catalyst surfaces: The NEMCA effect”, C.G. Vayenas, S. Bebelis, I.V. Yentekakis, P. Tsiakaras, H. Karasali and Ch. Karavasilis in “New Frontiers in Catalysis”, Guczi et al. (Eds.), *Studies in Surface Science and Catalysis*, Elsevier, Amsterdam, **75**, 2139-2142 (1993)
- J77.** “Ion spillover as the origin of the NEMCA effect” C.G. Vayenas, S. Bebelis, I.V. Yentekakis, S. Neophytides and Jiang Yi, in T. Inui et al (Editors) *New Aspects of Spillover Effect in Catalysis* *Studies in Surface Science and Catalysis* **77**, 111-117, Elsevier Science Publishers (1993)
- J78.** “High Temperature cyclic voltammetry of Pt electrodes in solid electrolyte cells”, Jiang Yi, A. Kaloyannis and C.G. Vayenas, *Electrochimica Acta* **38**(17), 2533-2539 (1993)
- J79.** “The origin of Non-Faradaic Electrochemical Modification of Catalytic Activity”, S. Ladas, S. Kennou, S. Bebelis and C.G. Vayenas, *J. Phys. Chem.* **97**, 8845-8847 (1993)
- 1994**
- J80.** “Non-Faradaic Electrochemical Modification of Catalytic Activity: Solid Electrolytes as Active Catalyst Supports”, C.G. Vayenas, S. Bebelis, I.V. Yentekakis, Ch. Karavasilis and J. Yi, *Solid State Ionics* **72**, 321-327 (1994).
- J81.** “In situ controlled promotion of catalyst surfaces via NEMCA: The effect of Na on the CO oxidation on Pt”, I.V. Yentekakis, G. Moggridge, R.M. Lambert and C.G. Vayenas, *J. Catalysis* **146**, 292-305 (1994).
- J82.** “Electrochemical promotion in catalysis: Non-Faradaic electrochemical modification of catalytic activity”, C.G. Vayenas, S. Ladas, S. Bebelis, I.V. Yentekakis, S. Neophytides, Jiang Yi, Ch. Karavasilis and C. Pliangos, *Electrochimica Acta* **39**(11/12), 1849-1855 (1994).
- J83.** “Potential-programmed reduction: A new technique for investigating chemisorption on catalysts supported on solid electrolytes”, Jiang Yi, I.V. Yentekakis and C.G. Vayenas, *J. Catalysis* **148**, 240-251 (1994)
- J84.** “In situ controlled promotion of Pt for CO oxidation via NEMCA using CaF₂ as the solid electrolyte”, I.V. Yentekakis and C.G. Vayenas, *J. Catalysis* **149**, 238-242 (1994)
- J85.** “Methane to Ethylene with 85% Yield in a Gas-Recycle Electrocatalytic Reactor-separator”, Y. Jiang, I.V. Yentekakis and C.G. Vayenas, *Science* **264**, 1563-1566, (1994)
- J86.** “Electrochemical Enhancement of a Catalytic Reaction in Aqueous Solution”, S. Neophytides, D. Tsiplakides, M. Jaksic, P. Stonehart and C.G. Vayenas, *Nature* **370**, 45-47, (1994)
- 1995**

- J87.** “Non-Faradaic Electrochemical Modification of Catalytic Activity: 8. Rh-catalyzed C₂H₄ oxidation”, C. Pliangos, I.V. Yentekakis, X.E. Verykios and C.G. Vayenas, *J. Catalysis* **154**, 124-136 (1995)
- J88.** “Electrochemical Promotion of IrO catalyst for the gas phase combustion of ethylene” E. Varkaraki, J. Nicole, E. Plattner, Ch. Comninellis and C.G. Vayenas, *J. Appl. Electrochemistry* **25**, 978-981 (1995)
- J89.** “Electrochemical Promotion in Emission Control Catalysis”, R.M. Lambert, I.R. Harkness, I.V. Yentekakis and C.G. Vayenas, *Ionics* **1**, 29-32 (1995)
- J90.** “The effect of Catalyst-Electrode Potential and Work Function on the Chemisorptive Bond of Oxygen on Pt interfaced with YSZ”, S.G. Neophytides and C.G. Vayenas, *Ionics* **1**, 80-84 (1995).
- J91.** “Selectivity Maximization of Ethylene Epoxidation via NEMCA with Zirconia and β ”-Al₂O₃ Solid Electrolytes”, Ch. Karavasilis, S. Bebelis and C.G. Vayenas, *Ionics* **1**, 85-91 (1995)
- J92.** “In situ controlled Promotion of Catalyst Surfaces via Solid Electrolytes: Ethylene Oxidation on Rh and Propylene Oxidation on Pt”, A. Kaloyannis, C. Pliangos, I.V. Yentekakis and C.G. Vayenas, *Ionics* **1**, 159-164 (1995)
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- P8. European Patent Appl. 94600002.3 "New monolithic three-way catalysts with optimized distribution of precious metals within three separate washcoat layers" C.G. Vayenas, X.E. Verykios, V.G. Papadakis, I.V. Yentekakis, C. Pliangos (1994).
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2. “Cogeneration of Nitric Acid and Electricity. Platinum Electrodes Employed in High-Temperature Fuel Cell”, Platinum Metals Review 25 (2), April (1981), p.56
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6. “Recycling reactions” P. Szuromi, Science 264, 1513 (1994)
7. “One-step process converts methane to ethylene in 85% yield”, C&EN June 13 (1994) p. 41
8. “Chemical engineers near «holy grail»”, Chemistry and Industry 22, June 20, 1994
9. “Electrocatalysis: Past, present and Future” in J.O’M. Bockris and Z.S. Minevski, Electrochimica Acta 39, 1471-79 (1994), last section, 1478 “NEMCA 1990’s”

H. BOOK REVIEWS

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I. REVIEWING

Served as a referee for the following Journals

Science	AIChE Journal
Journal of Catalysis	I&EC Fundamentals
Journal of Physical Chemistry	The Chemical Engineering Journal
Applied Catalysis A	I&EC Research
Catalysis Rev.-Science and Engineering	Energy and Fuels
Journal of the Electrochemical Society	Computers & Chemical Engineering
Solid State Ionics	Chemical Engineering Communications
Electrochimica Acta	Surface Science
Chemical Engineering Science	Topics in Catalysis
Catalysis Letters	Applied Catalysis B: Environmental
Journal of Applied Electrochemistry	Ionics

K. RECORD OF RESEARCH FUNDING

1977 - 80	Petroleum Research Fund, “Solid Electrolyte Aided Study of Catalytic Oxidations” <i>Principal Investigator:</i> Costas G. Vayenas	\$ 9,000
1978 - 80	National Science Foundation, “Solid Electrolyte Aided Study of Catalytic Oxidations”. <i>Principal Investigator:</i> Costas G. Vayenas	\$ 83,534
1979 - 80	M.I.T. Energy Lab Seed Money, “High Temperature Fuel Cells” <i>Principal Investigator:</i> Costas G. Vayenas	\$ 20,000
1979 - 80	Union Carbide, “Selective Catalytic Oxidations”	\$ 9,000
1979 - 80	Mobil, “Study of Ethylene Epoxidation on Silver”	\$ 9,000
1980 - 82	Department of Energy, “Cogeneration of Electric Energy and Useful Chemicals in a Fuel Cell” <i>Principal Investigators:</i> Costas G. Vayenas and J. Wei	\$ 150,076
1980 - 83	National Science Foundation, “Solid Electrolyte Aided Study of Catalytic and Electrocatalytic Oxidations” <i>Principal Investigator:</i> Costas G. Vayenas CPE800-9436	\$ 263,380
1981 - 82	H. and C. Dreyfus Teacher Scholar Award	\$ 40,000
1983 - 86	VW Stiftung, F.R. of Germany “Cogeneration of Electric Energy and Useful Chemicals in Fuel Cells” <i>Principal Investigators:</i> C.G. Vayenas, L. Riekert, H.-G. Lintz	90,000 DM
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1990 - 95	European Economic Community JOULE Programme “Fundamental Studies of NonFaradaic Catalysis” <i>Principal Investigators:</i> R. Lambert, C.G. Vayenas	100,000 €
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1992- 94	STRIDE Programme. European Economic Community. “Development of improved catalytic converters” (jointly with X.E. Verykios)	385.000,00 €
1992 - 95	CEC JOULE Programme “New SOFC Materials and Technology”	98.000,00 €
1992 - 95	CEC JOULE Programme “Operational Tests of SOFC and use of SOFC as Chemical Reactor”	50.000,00 €
1993 - 95	CEC Human Capital and mobility network: “Impact of surface mobility phenomena on catalytic activity and selectivity”	40.000,00 €
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1993 - 95	British Council (Hellenic-British collaboration) “Fundamental Studies in Non-Faradaic Catalysis” (with R.M. Lambert , S. Ladas, S. Kennou and S. Bebelis)	16.000,00 €
1994 -	Electric Power Research Institute (EPRI, U.S.A.) “Non-Faradaic Electrochemical Modification of Catalytic Activity”	\$ 25,000,00
1995 - 97	EPET-II Programme, National Secretariat of Research and Technology - EEC “Optimization, quality control and production of automotive exhaust catalytic converter” (with X.E. Verykios)	605.000,00 €
1995 - 98	EPET II Programme, National Secretariat of Research and Technology - EEC “Increase in the Hellenic Capacity of Recycling Spent Lube Oils” (with D. Theodorou, J. Tsamopoulos, S. Ladas)	604.000,00 €
1995- 98	CEC JOULE Programme “New energy-efficient processes for the partial oxidation of methane to ethylene and to methanol/formaldehyde”, Coordinator Total budget: 1,000,000 ECU	131.758,77 €
1996 -98	PENED «Metal-solid electrolyte catalysts”	29.347,03 €
1996 - 98	PABE: «Study of high durability concrete production with Greek artificial pozolans»	70.432,87 €
1996 - 01	BASF “Agreement field: Examination of the NEMCA-Effect on BASF-Relevant Catalytic Reactions”	112.571,76 €

1997 - 99	W0 60-25 EPRI “Electrochemical Promotion of the Ammonia Synthesis with electrically promoted pellets”	136.273,36 €
1997 - 99	Greek-Italian Cooperation «Electronic Promotion in Heterogeneous Catalysis»	6.156,53 €
1997 - 00	EC BRITE Programme (BRPR-CT97-0460) “Application of NEMCA and DIMSI Principles in Designing Novel DeNO _x catalysts for lean burn engines” (with X. Verykios)	303.376,32 €
1998 - 98	ECIA “Preparation and testing multi-supported three-way catalysts preparation & testing multi-sec”	14.367,55 €
1998 - 99	SCIENTIFIC DESIGN COMPANY “Laboratory expenses for the TPD Analysis”	5.426,47 €
1997 - 00	EU TMR Project FMRX-CT97-0130 “Synthesis, fabrication & characterization of alternative anodes for direct methane oxidation in solid oxide fuel cells”	169.900,11 €
1998 - 01	EPET 127-EKBAN «Development of integrated system of catalytic ceramic filters, membranes and sensors for the reduction and control of soot particulates from mobile and stationary sources»	206.016,14 €
1999 - 03	EU Growth Project G5RD-CT 1999-00154 “Catalyst Deactivation”	284.664,15 €
2000 - 03	EU TMR Project HPRN-CT-2000-00042 “Investigation of high temperature solid proton conductors of relevance to fuel processing & energy conversion applications”	161.943,00 €
2002 – 05	EU Growth Project G5RD-CT-2002-00710 “NO _x Abatement systems for next-generation environmental technologies”	369.639,00 €
2002 – 05	PENED “Metal-electrolyte catalysts for automotive exhaust gas treatment”	175.000,00 €
2003 - 06	TOYOTA “Catalysis and Electrocatalysis of NO reduction”	238.927,00 €
2004 - 06	DUPONT “Research and Development (including scale up) of electrochemical NEMCA technology”	125.812,00 €
2004 - 07	FP6-2003-NEST-A/2400 “Electrocatalytic Gas-phase conversion of CO ₂ in confined catalysts”	215.604,00 €
2005 - 06	EC AST4-CT-2005-516126 “Fuel Cell Application in a New Configured Aircraft”	94.000,00 €
2005 - 07	«AKMON: Design of heterogeneous catalysts and electrocatalysts for energy and environmental protection technologies»	245.000,00 €
2007-08	«05 NON EU 268: Application of Electrochemical Promotion in novel monolithic reactors»	14.000,00 €

2007-09	MSCF-CT-2006-046201: “Marie Curie Conferences and Training Courses”	28.000,00 €
2008-09	ARAMCO: “Research Agreement with University of Patras”	133.000,00 €
2008-10	CMR PROTOTECH AS: “High Temperature Fuel Cells”	75.000,00 €
2009-11	CERTH\CPERI: “Regenerative PEM Fuel Cells”	80.000,00 €
2010-13	GSRT: “Nano-structured electrodes for water electrolysis in high temperature Polymer Electrolyte Membrane electrolyzers”	130.000,00 €
2010-13	GSRT: “Electrochemically promoted CO ₂ hydrogenation for the production of clean fuel cells”	111.200,00 €

L. INVITED SEMINARS IN UNIVERSITIES, INDUSTRY AND RESEARCH CENTERS

1. February 1976, "The Oxidation of SO₂ on Noble Metals" Department of Chemical Engineering, University of California at Davis.
2. February 1976, "The Oxidation of SO₂ on Noble Metals" Department of Chemical Engineering, California Institute of Technology.
3. February 1976, "Electrochemical and Kinetic Study of SO₂ Oxidation on Noble Metals" Department of Chemical Engineering, Stanford University.
4. March 1976, "Electrochemical and Kinetic Study of SO₂ Oxidation on Platinum", Department of Chemical Engineering, Syracuse University.
5. March 1976, "Electrochemical and Kinetic Study of SO₂ Oxidation on Noble Metals", Department of Engineering and Applied Science, Yale University.
6. February 1977, "Electrochemical and Kinetic Study of SO₂ Oxidation on Noble Metals", Department of Chemical Engineering, M.I.T.
7. October 1978, "A New Approach to Oxidation Catalysis: Solid Electrolyte Potentiometry and Electrocatalysis", Department of Chemical Engineering, M.I.T.
8. November 1978, "A New Approach to Oxidation Catalysis: Solid Electrolyte Potentiometry and Electrocatalysis", ILP Symposium on Catalysis, M.I.T.
9. December 1978, "Solid Electrolyte Potentiometry and Electrocatalysis", Monsanto, St. Louis.
10. December 1979, "Cogeneration of Electrical Energy and Nitric Oxide", GM Laboratories, Warren, Michigan.
11. April 1980, "Ammonia High Temperature Fuel Cell", Department of Chemical Engineering, Tufts University.
12. April 1980, "Ammonia High Temperature Fuel Cell", Celanese Research Center, Summit, N.J.
13. July 1980, "Limit Cycle Phenomena During Ethylene and Ammonia Oxidation Over Platinum" Gordon Conference on Chemistry at Interfaces, Meriden, New Hampshire.
14. August 1980, "Vapor Phase Electrocatalytic Ethylene Epoxidation", E.I. DuPont de Nemours, Wilmington, Delaware.
15. October 1980, "Fuel Cell Cogeneration of Electricity and Useful Chemicals", Department of Engineering and Applied Science, Yale University.
16. October 1980, "Fuel Cell Cogeneration of Electricity and Useful Chemicals", Celanese Co., Corpus Christi.
17. October 1980, "Fuel Cell Cogeneration of Electricity and Useful Chemicals", Department of Chemical Engineering, University of Houston.
18. October 1980, "Fuel Cell Cogeneration of Electricity and Useful Chemicals", Exxon Research, Linden, N.J.
19. October 1980, "Limit Cycle Phenomena During Ethylene oxidation on Pt", Department of Chemistry, Brandeis University.
20. April 1981, "Cogeneration of Electricity and Chemicals in High Temperature Electrocatalytic Reactors", W.R. Grace Research Center.
21. September 1981, "Cogeneration of Electricity and Chemicals" Shell Res. Laboratories, Amsterdam, Holland.
22. September 1981, "Solid Electrolytes and Catalysis", Institut Francais du Petrol, Paris, France.
23. September 1981, "Solid Electrolytes and Catalysis", Monte-Edison Research Center, Novarra, Italy.

24. February 1982, "Solid Electrolytes and Catalysis", National Technical University Athens.
25. June 1983, "Solid Electrolyte-Aided Studies of Catalytic Reactions", University of Karlsruhe, F.R. Germany.
26. June 1984, "Optimal Catalyst Activity Distribution in Pellets", W.R. Grace Research, Washington, DC.
27. September 1984, "Solid Electrolytes and Catalysis", University of Thessaloniki, Greece.
28. December 1985, "Solid Electrolytes and Catalysis", Democritos Research Center, Athens, Greece.
29. June 1986, "Catalytic Phenomena in Solid Electrolyte Cells", Imperial College, London, UK.
30. June 1986, "Cogeneration of Electrical Power and Chemicals in Solid Electrolyte Cells" British Gas Research Division, London, UK.
31. September 1987, "Catalytic Phenomena in Solid Electrolyte Cells", University of Twente, Holland.
32. March 1988, "Catalytic and Electrocatalytic Reactions in Solid Oxide Fuel Cells", T.N.O., Zeist, Holland.
33. March 1988 "Solid Electrolytes and Catalysis", University of Liege, Belgium.
34. December 1988, "Non-Faradaic Electrochemical Modification of Catalytic Activity", W.R. Grace, Columbia, Maryland, USA.
35. December 1988, "Non-Faradaic Electrochemical Modification of Catalytic Activity", Princeton University, Princeton, USA.
36. December 1988, "Non-Faradaic Electrochemical Modification of Catalytic Activity", Yale University, 1988 Dodge Lecture, New Haven, USA.
37. December 1988, "Non-Faradaic Electrochemical Modification of Catalytic Activity", ARCO, Philadelphia, USA.
38. December 1988, "Non-Faradaic Electrochemical Modification of Catalytic Activity", University of Pennsylvania, Philadelphia, USA.
39. December 1988, "Non-Faradaic Electrochemical Modification of Catalytic Activity", University of Rochester, Rochester, USA.
40. December 1988, "Non-Faradaic Electrochemical Modification of Catalytic Activity", MIT, Cambridge, USA.
41. February 1990, "Solid Electrolytes and Catalysis", École Polytechnique Federale de Lausanne, Switzerland.
42. February 1990, "Non-Faradaic Electrochemical Modification of Catalytic Activity", École Polytechnique Federale de Lausanne, Switzerland.
43. February 1990, "On the origin of the NEMCA effect and on the dependence of catalytic rates on catalyst work function", École Polytechnique Federale de Lausanne, Switzerland.
44. March 1990, "Ethylene Epoxidation on Silver", École Polytechnique Federale de Lausanne, Switzerland.
45. March 1990, "Chemical Cogeneration", École Polytechnique Federale de Lausanne, Switzerland.
46. March 1990, "Non-Faradaic Electrochemical Modification of Catalytic Activity", Université de Poitiers, France.
47. September 1990, "Non-Faradaic Electrochemical Modification of Catalytic Activity" Center for Industrial Research (SI), Oslo, Norway.

48. October 1990, "Non-Faradaic Electrochemical Modification of Catalytic Activity. Oxidation and Oxidative Coupling of Methane", RISØ, Roskilde, Denmark.
49. October 1990, "Non-Faradaic Electrochemical Modification of Catalytic Activity", Chemetal-Lurgi, Frankfurt, Germany.
50. April, 1991, "Non-Faradaic Electrochemical Modification of Catalytic Activity", KFA Research Center, Julich, Germany
51. April, 1991, "Non-Faradaic Electrochemical Modification of Catalytic Activity", University of Hannover, Germany
52. June 1991, "Non-Faradaic Electrochemical Modification of Catalytic Activity", University of Tübingen, Germany
53. September 1991, "Promotion effects in Catalysis: Dependence of Catalytic Rates on Catalyst Work Function", W.R. Grace Research, Washington DC, USA
54. September 1991, "Non-Faradaic Electrochemical Modification of Catalytic Activity" Exxon Research, Annandale, NJ, USA
55. October 1991, "Non-Faradaic Electrochemical Modification of Catalytic Activity" City College, City University of New York, USA
56. October 1991, "Non-Faradaic Electrochemical Modification of Catalytic Activity" New England Catalysis Society, Worcester, Mass., USA
57. November 1991, "Non-Faradaic Electrochemical Modification of Catalytic Activity" Brookhaven National Laboratory, Long Island, USA
58. November 1991, "Non-Faradaic Electrochemical Modification of Catalytic Activity" Tufts University, Boston, USA
59. December 1991, "Non-Faradaic Electrochemical Modification of Catalytic Activity" Yale University, New Haven, USA
60. March 1992, "Non-Faradaic Electrochemical Modification of Catalytic Activity" Princeton University, USA
61. March 1992, "Non-Faradaic Electrochemical Modification of Catalytic Activity" University of Pennsylvania, USA
62. March 1992, "Non-Faradaic Electrochemical Modification of Catalytic Activity" Rohm & Haas, Pennsylvania, USA
63. March 1992, "Non-Faradaic Electrochemical Modification of Catalytic Activity" MIT, Cambridge, Ma, USA
64. March 1993, "Non-Faradaic Electrochemical Modification of Catalytic Activity" Fritz Haber Institute, Berlin, Germany
65. March 1993, "Non-Faradaic Electrochemical Modification of Catalytic Activity" LURGI GmbH, Frankfurt, Germany
66. April 1993, "Non-Faradaic Electrochemical Modification of Catalytic Activity" University of Milano, Italy
67. December 1993, "Non-Faradaic Electrochemical Modification of Catalytic Activity" University of Thessaloniki, Greece
68. May 1994, "Non-Faradaic Electrochemical Modification of Catalytic Activity" National Research Foundation (EIE), Athens, Greece
69. May 1994, "Non-Faradaic Electrochemical Modification of Catalytic Activity" EPRI, Palo Alto, Ca, USA
70. May 1995, "Non-Faradaic Electrochemical Modification of Catalytic Activity", BASF, Ludwigshaven, Germany
71. June 1995, "Electrochemical Activation of Catalysis", Weizmann Institute of Science, Rehovot, Israel
72. June 1995, "Electrochemical Activation of Catalysis", Technion, Haifa, Israel

73. June 1995, "Electrochemical Activation of Catalysis", University of Crete, Greece
74. August 1995, "Electrochemical Activation of Catalysis", Dalian Institute of Chemical Physics, Dalian, China
75. May 1996, "Electrochemical Activation of Catalysis", University of Ulm, Germany
76. October 1996, "Electrochemical Activation of Catalysis", KFA Research Center, Jülich, Germany
77. December 1996, "Electrochemical Activation of Catalysis", Electricité de France (EDF), Paris, France
78. February 1997, "Electrochemical Activation of Catalysis" Société Vandoise des Sciences Naturelles, Lausanne, Switzerland
79. March 1997, "Electrochemical Activation of Catalysis", Democritos Research Center, Athens
80. March 1997, "The NEMCA effect" BASF, Ludwigshafen, Germany
81. December 1997, "The NEMCA effect", Lurgi, Frankfurt, Germany
82. December 1997, "The NEMCA effect", BASF, Ludwigshafen, Germany
83. March 1998, "Electrons and Catalysis", Physics Department, University of Thessaloniki
84. November 1998, "Electrons and Catalysis", University of Thessaly
85. June 1999, "Electrochemical Promotion of Catalysis", EPFL, Lausanne
86. January 2000, "Electrochemical Promotion of Catalysis", BASF, Ludwigshafen, Germany
87. March 2000, "Electropromotion with proton conductors", Schloss Ringberg, Germany
88. March 2000, "Electrochemical Promotion of Catalysis", New England-New York, Catalysis Club, Bethlehem, PA, USA
89. March 2000, "Electrochemical Promotion of Catalysis", Engelhard, Philadelphia, USA
90. March 2000, "Electrochemical Promotion of Catalysis", Atofina, King of Prussia, PA, USA
91. June 2000, "Electrochemical Promotion of Catalysis", Technion, Haifa, Israel
92. June 2000, "Electrochemical Promotion of Catalysis", Weizmann Institute, Rehovot, Israel
93. November 2000, "Electrochemical Promotion of Catalysis", Twente University, Holland
94. March 2001, "Electrochemical Promotion of Catalysis", Bosch, Stuttgart, Germany
95. May 2001, "Electrochemical Promotion of Catalysis", NSF-EPRI, Washington DC, USA
96. September 2001, "Electrochemical Promotion of Catalysis" Ulm University, Ulm, Germany
97. November 2003, "Electrochemical Promotion of Catalysis" DuPont, Wilmington, DE, USA
98. November 2003, "SOFC and PEM fuel cells" Atofina, King of Prussia, USA
99. November 2003, "Electrochemical Promotion of Catalysis" UC Berkeley, Chemistry Dept. USA
100. February 2004, "SOFC and PEM fuel Cells" University of Thessaly
101. February 2005, "Electrochemical Promotion", Université de Nancy, France
102. April 2006, "Proton interactions in chemical, electrochemical and physical systems", EPFL, Lausanne
103. June 2007, "Electrochemical promotion of Catalysis", Université de Lyon and CNRS, France
104. June 2007, "Electrochemical Promotion of Catalysis", St. Gobain Research Center, France

M. *PLENARY, KEYNOTE AND INVITED LECTURES IN INTERNATIONAL CONFERENCES*

1. July 1980, "Limit Cycle Phenomena during Ethylene and Ammonia Oxidation over Pt" Invited Lecture, Gordon Conference on Chemistry at Interfaces, Meriden, New Hampshire
2. September 1987, "Catalytic and Electrocatalytic Phenomena in Solid Electrolyte Cells", Plenary Lecture, 6th International Conference on Solid State Ionics, Garmisch-Partenkirchen, F.R. Germany, Sept. 6-11, 1987.
3. September 1987, "Faradaic and NonFaradaic electrocatalysis in Solid Electrolyte Cells", Invited Keynote Lecture, 38th Meeting of the International Society of Electrochemistry (ISE). Maastricht, Holland Sept. 14-18, 1987.
4. November 1989, "Non-Faradaic Electrochemical Modification of Catalytic Activity in Zirconia Cells" (plenary lecture given by S. Seimanides), American Ceramic Association National Meeting, Anaheim, USA.
5. April 1990, "Non-Faradaic Electrochemical Modification of Catalytic Activity", (invited lecture) Rideal Congress on Catalysis, Cambridge, England.
6. November 1990, "Non-Faradaic Electrochemical Modification of Catalytic Activity" (invited lecture) Shell Conference on Oxidation Catalysis, Wolfheze, Holland
7. April 1991, "Non-Faradaic Electrochemical Modification of Catalytic Activity" (plenary lecture) 3d Intl. Symposium on Systems with Fast Ionic Transport, Holzhau, Germany
8. June 1991, "Non-Faradaic Electrochemical Modification of Catalytic Activity" (invited lecture), Gordon Conference on Catalysis, New Hampshire, USA
9. September 1991, "Non-Faradaic Electrochemical Modification of Catalytic Activity" (plenary lecture), 7th Intl. Symposium on Heterogeneous Catalysis, Varna, Bulgaria
10. October 1991, "Non-Faradaic Electrochemical Modification of Catalytic Activity in Solid Electrolyte cells" (keynote lecture), 8th International Conference on Solid State Ionics, Lake Louise, Canada
11. July 1992, "Non-Faradaic Electrochemical Modification of Catalytic Activity" (Invited Lecture) 1992, International Symposium on C₁ Reactions, Vienna, Austria
12. November 1992, "Electrochemical Activation of Catalyzed Reactions" (Invited Lecture) NATO Advanced Research Workshop "Elementary reaction steps in Heterogeneous Catalysis", Bedoin, France.
13. May 1993, "Electrochemical Activation of Catalyzed Reactions" (Invited Lecture), 13th European Chemical Reaction Engineering Conference (CCRE 13), Windsor, England
14. July 1993, "In situ reversible promotion of Catalysts using ion-conducting metal oxides" (Invited lecture) 2nd Schwab Conference, Berlin, Germany
15. August 1993, "Ion spillover as the origin of the NEMCA effect" (Invited lecture) 3d International Conference on spillover, Kyoto, Japan
16. September 1993, "Non-Faradaic Electrochemical Modification of Catalytic Activity in solid electrolyte cells" (Plenary lecture) 14th International Symposium on Materials Science, Riso, Denmark
17. September 1993, "Non-Faradaic Electrochemical Modification of Catalytic Activity" (Keynote Lecture) 9th International Conference on Solid State Ionics, The Hague, Netherlands
18. September 1993, "Non-Faradaic Electrochemical Modification of Catalytic Activity" (Keynote lecture) International Symposium on Electrocatalysis, Ferrara, Italy
19. May 1994, "Non-Faradaic Electrochemical Modification of Catalytic Activity" (Invited Lecture) 185th Electrochemical Society Meeting, San Francisco, USA
20. August 1994, "Non-Faradaic Electrochemical Modification of Catalytic Activity" (Keynote Lecture) 45th Intl. Society of Electrochemistry (ISE) Meeting, Oporto, Portugal
21. May 1995, "In situ controlled Promotion of catalyst surfaces via Solid Electrolytes" (Keynote Lecture) 94th Annual Meeting of the Deutsche Bunsen-Gesellschaft für Physikalische Chemie, Bremen, Germany
22. June 1995, "Non-faradaic Electrochemical Modification of Catalytic Activity"

- (Plenary Lecture) 13th International Symposium on Electrochemistry, Vranka Bania, Yugoslavia
23. September 1995, "Non-Faradaic Electrochemical Modification of Catalytic Activity" (Invited talk) 46th Annual International Society of Electrochemistry (ISE) Conference, Xiamen, China
 24. November 1995, "Non-Faradaic Electrochemical Modification of Catalytic Activity" (Invited Lecture given by I.V. Yentekakis) 186th Electrochemical Society Meeting, Chicago, U.S.A.
 25. March 1996, "Electrochemical Activation of Catalysis" (Invited Lecture) European Workshop on the relation between Solid State and Aqueous Electrochemistry Schloss Ringeberg, Germany
 26. September 1996, "Non-Faradaic Electrochemical Modification of Catalytic Activity using solid electrolytes" 3rd Euroconference on Solid State Ionics, (Invited Lecture), Sardinia, Italy
 27. October 1996, "Electrochemical Activation of Catalysis" (Award Lecture) 190th ECS Meeting, San Antonio, USA
 28. October 1996, "Electrochemical Activation of Catalysis" (Plenary Lecture) GDCh Angewandte Electrochemie, Monheim, Germany
 29. July 1997, "The modern problems of gas phase electrocatalysis and electrochemical promotion" (Plenary Lecture) 2nd memorial G.K. Boreskov Conference, Novosibirsk, Russia
 30. July 1997, "Thermodynamic and kinetic considerations of Solid Gas Interactions, Catalysis, Electrocatalysis, Gas reforming" (3 invited lectures) International School of materials Science and Technology, Erice, Italy
 31. September 1997, "Direct STM, XPS and TPD observation of spillover phenomena over mm distances on metal catalyst films interfaced with solid electrolytes (plenary lecture) 4th Intl. Conference on Spillover, Dalian, China
 32. September 1997, "Electrochemical activation of complete and partial oxidation reactions" (plenary lecture) 2nd World Congress on Oxidation Catalysis, San Diego, U.S.A.
 33. September 1999, "Electrochemical promotion of environmentally important reactions" 50th International Society of Electrochemistry (ISE) Meeting (Keynote lecture), Pavia, Italy
 34. September 1999, "Electrochemical Promotion: Origin and Applications" 3rd International Conference on Electrocatalysis (Keynote lecture), Portoroz, Slovenia
 35. October 1999, "Electrochemical Promotion in Catalysis" Euroconference on Fast Oxidation Catalysis, (Keynote lecture), Lelystadt, Holland
 36. September 2002, "Electrochemical Promotion in Catalysis", 53rd International Conference of ISE, (Keynote Lecture), Düsseldorf, Germany
 37. September 2003, "Electrochemical Promotion in Catalysis", 54th International Conference of ISE, (Keynote Lecture), San Pedro, Brazil
 38. May 2004, "A new triode fuel cell", 7th ISSFIT, (Invited talk), Slovenia
 39. May 2004, "Thermodynamics of Adsorbed Species and the Double Layer approach to catalysis", PPEPPD-2004, (Invited talk), Salt Lake City, USA
 40. September, 2004, "Solid State Electrocatalysis and Electrochemical Promotion: From Fundamentals to Monolithic Electropromoted Reactors", 55th ISE, (Plenary Lecture), Thessaloniki, Greece.
 41. September 2004, "Electrochemical Promotion of Catalysis", (Plenary Lecture replacing J. Ross), 55th International Conference of ISE, Thessaloniki, Greece
 42. July, 2005, "Solid Electrolyte Electrocatalysis and Electrochemical Promotion", 3rd Gerisher Symposium on Electrocatalysis: Theory and Experiment, (Invited talk), Berlin
 43. August, 2006, "First principles computation of the conductivity of hydrated Nafion membranes", 57th Annual Meeting of the ISE, (Invited talk), Edinburgh, UK
 44. October, 2007, "The quest for the origin of Electrochemical Promotion", 1st International Conference on the Origin of Electrochemical Promotion of Catalysis (OREPOC), (Plenary Lecture), Thessaloniki, Greece
 45. June, 2008, "Electrochemical and chemical promotion of catalysis", 5th University of California Symposium on Surface Science and its Applications, (Invited talk), Santa Barbara, U.S.A.
 46. August 2008, "Electrochemically promoted monolithic reactors", 8th European Symposium on Electrochemical Engineering (ESEE), CHISA Congress, (Keynote Lecture), Prague, Czech Republic.

47. September 2008, "Electrochemical promotion of catalytic reactions with sputtered metal catalyst-electrode films in a monolithic electropromoted reactor", 59th Annual Meeting of the International Society of Electrochemistry, (Invited talk), Seville, Spain
48. July 2009, "Electrocatalysis and Electrochemical Promotion with Oxygen Ion and Proton Conductors", SSI-17, (Plenary lecture), Toronto, Canada.
49. June 2010, "Electrochemical Promotion of Selective Oxidations: Some Examples", Irsee V Conference, (Invited Talk), Irsee, Germany.
50. June 2010, "Electrochemical Promotion of Catalysis", RSE-SEE, (Invited Talk), Beograd, Serbia.
51. August 2010, "Electrochemical Promotion of Catalysis", ACS, 240th National Meeting and Exposition Symposium, (Invited Talk) Boston, USA.
52. September 2010, "On the Negative Impedance Region and Proton Transfer Mechanism in Fully Hydrated Nafion Membranes", The 61st Annual Meeting of the International Society of Electrochemistry, (Invited Talk), Nice, France.
53. October 2010, "Promotion, Electrochemical Promotion and Metal-Support Interactions", Fritz-Haber Institute der Max-Planck Gesellschaft, (Invited Talk), Berlin, Germany.
55. June 2011, "Chemical Cogeneration and Electrochemical Promotion of Catalysis", Summer School: "Energy and Materials from the Sun", Rolduc Abbey, The Netherlands.
56. July 2011, "The Use of Anionic and Cationic Conductors for the Electrochemical Promotion of Catalysis", The 18th International Conference on Solid State Ionics, (Plenary lecture), Warszawa, Poland.

GRADUATE STUDENTS SUPERVISION

Ph.D. Students :

1. James Michaels, Sc.D. M.I.T. (1983) (with J. Wei), Associate Professor, University of California, Berkeley, Mobil, NJ
2. Michael Stoukides, Sc.D.M.I.T. (1982), Associate Professor Tufts University, Professor, University of Thessaloniki
3. Mark Manton, Sc.D. MIT (1986) (with J. Wei), Shell Laboratories, Amsterdam
4. Ioannis V. Yentekakis, Ph.D. (1987) Postdoctoral Fellow, Princeton University, Professor, Technical University of Crete
5. Stelios G. Neophytides, Ph.D. (1988), Postdoctoral Fellow, Gent University, Univ. of Patras, Research Director, ICE/HT Patras
6. Symeon Bebelis, PhD (1989), Assistant Professor, University of Patras
7. Vagelis G. Papadakis, PhD (1990), Associate Professor, University of Ioannina
8. Efstratios Kolyfetis, PhD (1993), Researcher, AGET Herakles, Athens
9. Demetrios Spartinos, PhD (1993), Lecturer, University of Patras
10. Panagiotis Tsiakaras, PhD (1993), Associate Professor, University of Thessaly
11. Apostolos Ioannides, PhD (1993), Private Instructor, Patras
12. Christos Karavasilis, PhD (1994), Researcher, Lube Processing Co. (LPC), Athens
13. Heleni Karasali, PhD (1994), Researcher-Lecturer, Benaki Phytopathological Institute, Athens
14. Yi Jiang, PhD (1994), Associate Professor, Dalian Institute of Chemical Physics, Dalian, China
15. Costas Pliangos, PhD (1995), Postdoctoral coworker, University of Patras
16. Antony Kaloyannis, PhD (1995), Bacakos Inc., Sales Manager, Athens
17. Maria Makri, PhD (1999), Postdoctoral researcher, University of Patras
18. Constantina Yiokari, PhD (2000)
19. Dimitrios Tsiplakides, PhD (2001), Assistant Professor, Aristotle University of Thessaloniki
20. Yannis Bafas, PhD (2003)
21. Costas Raptis, PhD (2003)
22. Thomas Bathas, PhD (2003)
23. Alexandros Katsaounis, PhD (2004), Assistant Professor, University of Patras
24. Aristotelis Frantzis, PhD (2004)
25. Stella Balomenou, PhD (2005), Chemical Engineer, PhD, CPERI/CERTH, Thessaloniki
26. Yannis Constantinou, PhD (2005)
27. Alexandros Giannikos, PhD (2006)
28. Dimitra Archonta, PhD (2007)
29. C. Koutsodontis, PhD (2008)
30. F. Sapountzi, PhD (2009)
31. S. Souentie, PhD (2009)
32. D. Presvytes, PhD (2009)
33. M. Tsampas, PhD (2010)
34. V. Papaioannou, PhD (2010)
35. D. Theleritis, PhD expected
36. S. Divane, PhD expected
37. M-E. Makri, PhD expected

M.S. Students :

1. Bowei Lee, M.S., M.I.T. (1979)
2. Roger Farr, M.S., M.I.T. (1980)
3. James Mulready, M.S., M.I.T. (1980)
4. Catherine Teague-Sigal, M.S., M.I.T. (1981)
5. Pablo Debenedetti, M.S., M.I.T. (1982) Professor, Princeton University,
Member of the National Academy of Engineering, USA

Postdoctoral Fellows

1. Panagiotis Petrolekas, (1999) Assistant Professor, Dept. of Environmental Engineering, Democritus University of Thrace
2. Jiang Yi (1994-96), Associate Professor, Dalian University
3. Xingang Li (2005-2006), Associate Professor, School of Chemical Engineering and Technology, Tianjin University, China