

CURRICULUM VITAE

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EDUCATION: 1973 Ph.D. - Columbia University
1967 B.S. - National Taiwan University

EXPERIENCE: 1990- Professor, Univ. of Rhode Island
1985-1990 Associate Professor, Univ. of Rhode Island
1981-1986 Visiting Scientist, MIT Regional Laser Center
1980-1985 Assistant Professor of Chemistry, Univ. of Rhode Island
1975-1979 Associate Professor of Chemistry, National Taiwan Univ.
1973-1975 Postdoctoral Fellow, University of Iowa

RESEARCH ACTIVITIES:

Molecular spectroscopy, chemical reaction dynamics.
Material science, conductive polymers, electrochromism, antielectrostatic polymer, anticorrosion coatings, synthesis and processing of polymers for electronic and optical applications. Electrochemistry, spectroscopy. Chemical Sensors.

Honors:

Alcoa Foundation Award (1995), URI Foundation Intellectual Properties Contribution award (2000).

Services:

US Department of Energy Research Review Panel, Energy Conservation.
Referee for Research Grant proposals and professional journals.

Publications:

Books: Co-editor for conference proceedings
Contribute chapters in two books.

Research Article: 70 research articles
in areas of conducting polymers, electrochromism, corrosion science,
optical materials and spectroscopy.

Review Article: 2 invited review papers.

Patents: 10 patents issued, 4 pending.

Conference Proceeding (Co-Editor):

“Optical and Photonic Applications of Electroactive and Conducting Polymers”, Sze C. Yang and P. Chandrasekhar, SPIE Proceedings, Vol. 2528 (1995).

Review Articles

1. "Conducting Polymer as Electrochromic Material: Polyaniline"
S. C. Yang, pp.335-365 in "Large-area Chromogenics: Materials and Devices for Transmittance Control", C. M. Lampert and C. G. Granqvist, Editor, (SPIE Publishing, 1989).
2. "Spectroscopy and Structure of the Alkali Hydride Diatomic Molecules and Their Ions",
William C. Stwalley, W. T. Zemke and Sze Cheng Yang
Journal of Physical and Chemical Reference Data, 20, 153-187 (1991).

Patent Publications and Pending Applications:

- 1 "A New Electronic Display Device,"
Sze Cheng Yang and Richard R. Durand,
United States Patent 4586792,
Published May 6, 1986
2. "Variable Transparent Color Panels",
Sze Cheng Yang and Richard R. Durand,
United States Patent 4749260
Published June 7, 1988
3. "An Electrodeless Plating Method for Combining the Polymerization and the Coating of Electrochromic Polymers".
Sze Cheng Yang and Robert Clark,
United State Patent, 4842383.
Published June 27, 1989
4. "Solid Electrolytes for Conducting Polymer-based Color Switchable Windows and Electronic Display Devices".
Sze Cheng Yang and Jyun Hwei Hwang, United State Patent, 5253100, Oct. 12, 1993.
5. Molecular Complex of Conductive Polymer and polyelectrolyte; and aprocess of producing same
Jia M. Liu, Linfeng Sun, Sze C. Yang,
U.S. Patent 5,489,400, Feb. 6, 1996

5. AFiber Optic Glucose Biosensor@
C. W. Brown, S. C. Yang, A. G. Rand, Z. Ge, C. Chen, A. Santos, L. Sun
U.S. Patent application, Serial No. 08 / 201,811 filed, June, 1994
6. AElectroactive Polymer Coating for Corrosion Control@
S. C. Yang, R. J. Racicot, R. L. Clark, H. Liu, R. Brown, M. N. Alias
U.S. Patent 6,150,032, granted Nov. 2000
Published Nov. 21, 2000
7. Conducting Polymers for Coatings and Antielectrostatic Applications
S. C. Yang, H. Liu, R. L. Clark
U.S. Patent 6,656,388. application 98/ 23032, issued 12/2/2003
International Publication WO 99/22380
Published May 6, 1999
8. A Water-Borne Anti-Corrosive Coating Composition,
S. C. Yang and R. Brown,
US Patent application Serial number 60/110,612 pending, (filed 1999)
8. A Chromatographic and Electrophoretic Separation of Chemicals Using Electrically
Conducting Polymers@
S. C. Yang, P. Brown, C. Robbs
US Patent 6,821,417,. (Nov. 24, 2004)
9. A Synthesis of a Water Dispersible Complex between Polypyrrole and Poly(acrylic
acid)@
S. C. Yang, P. A. McCarthy
U.S. Patent application, Serial No. 09/825,460, filed April, 2001.
10. An inorganic-organic hybrid containing conducting polymers@
J. Sinko, S. C. Yang
U.S. Provisional patent application, March 2001
11. Water Soluble Polymeric Complex Comprising a Conducting Polymer and a Biopolymer
S. C. Yang, P. A. McCarthy
U.S. Patent application, Serial No. 09/825,074, filed April, 2001.
12. Functionalized and Processable Conducting Polymers
S. C. Yang, W. Li,
13. Chemical Synthesis of Water-Soluble, Chiral Conducting-Polymer Complexes@
H. Wang, S. C. Yang, P. A. McCarthy

U.S. Patent Application filed, Aug. 2001

14. Conducting Polymers for Treatment of the surfaces of metal and nonmetals

S. C. Yang

U.S. Provisional Patent Application filed, Sept. 2001

List of Publications (Sze C. Yang):

1. "A Continuous Wave Photofragment Spectrometer,"
M. Dzvonik and S.C. Yang, Rev.Sci. Instrum., 45 750 (1974).
2. "Theory of the Angular Distribution of Molecular Photofragments,"
S. C. Yang and R. Bersohn,
J. Chem. Phys., 61 4400 (1974).
3. "Photodissociation of Molecular Beam of Aryl Halides,"
M. Dzvonik, S.C. Yang and R. Bersohn,
J. Chem. Phys., 61 4408 (1974).
4. "An Arc-Heated High Intensity Hydrogen Atom Source,"
K.R.Way, S.C. Yang, and W.C. Stwalley,
Rev. Sci. Instrum., 47 1049(1976).
5. "A Li/Li₂ Supersonic Nozzle Beam,"
C.Y.R. Wu, J.B.Crooks,S.C. Yang, K.R.Way and W.C.Stwalley,
Rev. Sci. Instrum., 49 380 (1978).
6. "The Potential Energy Curves of the X¹E⁺ and A¹E⁺ States of CsH,"
Y.K. Hsieh, S.C. Yang, A.C. Tam and W.C. Stwalley,
J.Chem. Phys., 68 1448 (1978).
7. "Photon and Positive Ion Production from Collisions of Superthermal Hydrogen Atoms
with Lithium Atoms and Molecules,"
J.B. Crooks, K.R. Way, S.C. Yang, C.Y.R. Wu and W.C. Stwalley,
J. Chem. Phys.,69 490 (1978).
8. "The Dissociation Energy of CsH,"
W.C. Stwalley, S.C. Yang, Y.K. Hsieh, F.B.Orth and K.C. Li,
J. Chem. Phys., 69 1971 (1978).
9. "Transitional Energy Distribution of the Photofragments of SO₂ at 193 nm,"
A. Freedman, S.C. Yang and R. Bersohn,
J. Chem. Phys., 70 5313 (1979).

10. "Photodissociation of Aryl Halides,"
A. Freedman, S.C. Yang, M. Kawasaki and R. Bersohn,
Kokagaku Toronkai Koen Yoshishu, 232 (1979).
11. "Laser Induced Fluorescence Spectra of Hydroxyl Radical from Photolysis of
Hydrogen Peroxide at 193 nm,"
S.C. Yang and R. Bersohn,
Kosoku Hanno Toronkai Keon Yokoshu, 14 133 (1979).
12. "Photodissociation of Aryl and Aryl-Alkyl Halides at 193nm: Fragment Recoil Energy
Distributions,"
A. Freedman, S.C. Yang, M. Kawasaki and R. Bersohn,
J. Chem. Phys., 72 1028 (1980).
13. "Energy Distribution of the Fragments Produced by Photodissociation of CS₂ at 193 nm,"
S.C. Yang, A. Freedman, M. Kawasaki and R. Bersohn,
J. Chem. Phys., 72 4058 (1980).
14. "New Spectroscopic Analysis and Potential Energy Curves for the X¹E⁺ and A¹E⁺ States
of NaH,"
F.B. Orth, W.C. Stwalley, S.C. Yang and Y.K. Hsieh,
J. Mol. Spectrosc., 79 314 (1980).
15. "The RKR Potential Energy Curves for the A¹E⁺ and the X¹E⁺ States of KH,"
S.C. Yang, Y.K. Hsieh, K.K. Verma and W.C. Stwalley,
J. Mol. Spectrosc., 83 304 (1980).
16. "The RKR Potential Energy Curves for the A¹E⁺ --- X¹E⁺ States of RbH,"
Y.K. Hsieh, S.C. Yang, A.C. Tam, K.K. Verma and W.C. Stwalley,
J. Mol. Spectrosc., 83 311 (1980).
17. "Laser-Induced Fluorescence Study of the Photodissociation Dynamics of Small
Molecules,"
R. Bersohn, G. Ondrey, S. Kanfer, P. Brewer and S.C. Yang,
J. Photochem., 17 256 (1981).
18. "An Investigation of the Transition Moment of the A¹E⁺ --- X¹E⁺ Bands
of CsH,"
S. C. Yang, Y. K. Hsieh, A.C. Tam, W.T. Zemke, K.K. Verma and W.C. Stwalley,
J. Chem. Phys., 75 3679 (1981).
19. "Ionic-Covalent Interactions in the Alkali Hydrides,"
S.C. Yang and W.C. Stwalley,
ACS Symposium Series, 179 241 (1982).

20. "The Avoided Crossing Region of the CsH A¹E⁺ --- X¹E⁺ Potential Energy Curve,"
S.C. Yang,
J. Chem. Phys., 77 2884 (1982).
21. "The Dissociation Energies of the Diatomic Alkali Hydrides,"
S.C. Yang, D.D.Nelson and W.C.Stwalley,
J. Chem. Phys., 78 4541 (1983).
22. "Fluorescence Lifetime and Oxygen Quenching Rate of Gas Phase Fluoranthene
Excited at 337.1 nm,"
L.J. Jandris, R.K. Force and S.C. Yang,
Applied Spectroscopy, 39, 266 (1985).
23. "Electrochemical Doping of Polyaniline: Effects on Conductivity and Optical
Spectra,"
P. M. McManus, S. C. Yang, and R. J. Cushman,
J. Chem. Soc., Chem. Commun., 1556 (1985).
24. "Spectroelectrochemical Study of Polyaniline: The Construction of
a Ph-Potential Phase Diagram",
Richard J. Cushman, Peter M. McManus and Sze Cheng Yang,
J. Electroanalytical Chemistry and Interfacial Chemistry, 291 (1986) 335-346.
25. "The Influence of Oxidation and Protonation on the Electrical Conductivity of
Polyaniline",
Peter M. McManus, Richard J. Cushman and Sze Cheng Yang,
J. Phys. Chem., 91 (1987) 744-747 (1986).
26. "Protonation and Electrochemical Doping of Polyaniline: Correlation Between the
Changes in Electrical Conductivity and Optical Spectrum",
Richard J. Cushman, Peter M. McManus and Sze Cheng Yang,
Makromol. Chem, Rapid Commun, 8 (1987) 69-75.
27. "Morphological Modification of Polyaniline Using Polyelectrolyte Template Molecules."
J. H. Hwang and S. C. Yang, Synth. Metals, 29, E271-6 (1989).
28. "Experimentally determined pH-potential phase diagram for polyaniline."
S. C. Yang, R. J. Cushman, D. Zhang, Synth. Metals, 29, E401-8 (1989).
29. "Poly-(2-Methoxyaniline): The Effect of Chemical Modification on the
Insulator/Conductor Transitions of Polyaniline"
R. L. Clark and S. C. Yang, Synth. Metals, 29, E337-42 (1989)

30. "Polyaniline: Kinetics of Electrochemical Doping Studied by Time Resolved Absorption Spectroscopy", D. Zhang, J. H. Hwang and S. C. Yang, Synth. Metals, 29, E251-6 (1989).
31. "The 0.9 eV Absorption Band of Polyaniline: A Morphologically Sensitive Electronic Absorption"
D. Zhang, J.-H. Hwang, S. C. Yang
MRS Symposium Proceeding, 173, 305-312 (1990)
32. "Polyaniline as a Reversibly Switchable Electrochromic Material,"
W.-R. Shieh, S. C. Yang, C. Marzzacco and J.-H. Hwang.
MRS Symposium Proceedings, 173, 329-334 (1990).
33. "Novel Colloidal Polyaniline Fibrils Made by Template Guided Chemical Polymrization",
J.-M. Liu and S. C. Yang, J. Chem. Soc., Chem. Comm., 1529 (1991).
34. "Spectroscopy and Structure of the Alkali Hydride Diatomic Molecuales and Their Ions",
W. C. Stwalley, W. T. Zemke and S. C. Yang, J. Phys. Chem. Ref. Data, 20, 153-187 (1991).
35. "Novel Template Guided Synthesis of Polyaniline",
J.-M. Liu, L. Sun, J.-H. Hwang and S. C. Yang, Materials Research Society Symposium Proceedings, **247**, 601 (1992).
36. "The 1.5 eV Polaron Transition of Polyaniline: The spectro-electrochemical Resolution into sub-bands",
H. Liao and S. C. Yang, Material Research Society Symposium Proceedings, **247**, 741 (1992).
37. "Template-Guided Synthesis of Conducting Polymers: Molecular Complex of Polyaniline and Polyelectrolyte.", L. Sun, S. C. Yang, J.-M. Liu, American Chemical Society, Polymer Preprints, **33**, 379 (1992).
38. "Novel Colloidal Polyaniline Fibrils: (I) the Morphology Study.", Jia-Ming Liu and Sze C. Yang, MRL Bull. Res. Dev., **6** (1992) 1-6.
39. "Novel Colloidal Polyaniline Fibrils: (II) the Electronic Absorption Spectra Study in Aqueous Solution", Jia-Ming Liu and Sze C. Yang, MRL Bull. Res. Dev., **6** (1992) 7-12.
40. "Fiber-Optic pH Sensor Based on Evanescent Wave Absorption Spectroscopy",
A. Ge, C. W. Brown, L. Sun and S. C. Yang, Anal. Chem., **65**, 2335 (1993).

41. "Conducting Polymer with Improved Long-time Stability: Polyaniline-Polyelectrolyte Complex." Lingfeng Sun, Sze C. Yang and Jia-Ming Liu, *Mat. Res. Soc. Symp. Proc.*, **328**, 209 (1994).
42. "Solution Processable Conducting Polymer: Polyaniline-Polyelectrolyte Complex.", Linfeng Sun and Sze C. Yang, *Mat. Res. Soc. Symp. Proc.*, **328**, 167 (1994).
- 43.. "Thin Film Conductive Polymers on Aluminum Surfaces: Interfacial Charge Transfer and Anti-corrosion Aspects", R. Racicot, R. L. Clark, H.-B Liu, S.C. Yang, M.N. Alias and R. Brown, *SPIE Proceedings*, **2528**, 251 (1995).
- 44.. "Molecular Design of Conducting Polymer for Electrochromic Applications", R. L. Clark, H. Liao, W.-R. Hsieh, W. Xiong, H. Liu, R. Racicot, S. C. Yang, *SPIE Proceedings*, **2528**, 198 (1995).
45. "Anticorrosion of Aluminum: A novel electroactive undercoat", R. Racicot, M.N. Alias, R. Brown, R. L. Clark, H.-B. Liu and S.C. Yang, *Mat. Res. Soc. Symp. Proc.* **413**, 529-534 (1996).
47. "Corrosion Protection of Aluminum Alloys by Double-Strand Polyaniline" R. Racicot, R. Brown, S. C. Yang, *Syn. Met.* **85**, 1263 (1997)
48. "Double-Strand Polyaniline" L. Sun, H. Liu, R. Clark, S. C. Yang, *Syn Met* **85**, 67 (1997)
49. "Evidence of a Passive Layer formation from a conductive polymer coating on aluminum alloys." R. J. Racicot, S. C. Yang, R. Brown, *Mat. Res. Soc. Symp. Proc.* **458**, 415-420 (1997)
50. "Corrosion Protection Comparison of a Chromate Conversion Coating to a Novel Conductive Polymer Coating on Aluminum Alloys", R. J. Racicot, S. C. Yang, R. Brown, *NACE Corrosion 97*, Paper 531, pp 1-7 (1997).
51. Corrosion Protection of Aluminum Alloys by Conductive Organic and Inorganic Polymers, R. Brown, S. Yang, R. Racicot and R. Clark, and J. Neely, Triservice conference. Nov. 1997, San Diego, CA.
52. "Polymeric Complexes of Polyaniline as Anticorrosion Coatings", R. J. Racicot, S. C. Yang, R. Brown, *Mat. Res. Soc. Symp. Proc.* **488**, 733-740 (1998)
- 53 "A Latex-like water-borne polyaniline for coating applications", H. Liu, R. Clark, S. C. Yang, *Mat. Res. Soc. Symp. Proc.* **488**, 747-752 (1998).

54. “Double-strand polyaniline as molecular memory to chemical stimuli”, G.P. Kota, L. Sun, H. Liu, S. C. Yang, *Mat. Res. Soc. Symp. Proc.* **488**, 359-364 (1998)
55. Polyaniline molecular Complexes as Anticorrosion Coatings. R. J. Racicot, R. L. Clark, S. C. Yang, MRS National Meeting, Boston, Nov. 1997.
56. “Near-Infrared Fiber Optic Biosensor for Glucose”, C-S. Chen, C. W. Brown, L. Sun, S.C. Yang, A. G. Rand, Jr, A. F. Santos, *Analytical Chemistry*
57. “Corrosion Protection of Aluminum Alloys by conductive organic and inorganic polymers.”, R. Brown, S. Yang, R. Racicot, R. Clark, J. Neely, NACE International, T-9 Proceedings (1997).
58. “A polyaniline coating material for inhibiting corrosion in marine environment”, Yuan Lin, Sze C. Yang, Robert Clark, R. Brown, *Mat. Res. Soc. Proc.*, 598 (1999)
59. “Synthesis of a water dispersible inter-polymer complex of polyaniline” Patrick A. McCarthy and Sze C. Yang, *Mat. Res. Soc. Proc.*, **598** (1999)
60. “Conducting Polymers as Additives in the Primer Coatings for Aluminum Alloys”, a presentation at NACE Corrosion/2000, Research in Progress Symposium, Session 1: Conductive Polymers as Corrosion Resistant Coatings, Orlando, March 26, 2000. Abstract.
61. “Electrochemical Impedance Spectroscopy Studies of a Double Strand Polyaniline Coating on Aluminum Alloys in Acidic Environments”
Robert J. Racicot, Sze C. Yang, Richard Brown
Proceedings of Corrosion / 2000, Research Topical Symposium, Surface Conversions of Aluminum and Ferrous Alloys for Corrosion Resistance, pp 113-128 (2000)
62. “New water-borne electroactive polymers for coating applications”
Patrick McCarthy, Wenguang Li, Sze C. Yang
Proceedings of the American Chemical Society, PMSE, **83**, 315-316 (2000)
63. “Electroactive polymers for corrosion inhibition of aluminum alloys”
S. C. Yang, R. Brown, R. Racicot, Y. Lin, F. McClarnon
Polymer Preprints **41**, 1777 (2000)
64. “Functionalized conducting polymer for coatings on metals”
W. Li, S.C. Yang,
Polymer Preprints **41**, 1785 (2000)
65. “Electroactive polymer for corrosion inhibition of aluminum alloys”
S. C. Yang, R. Brown, R. Racicot, Y. Lin, F. McClarnon

- Invited contribution as a chapter for
American Chemical Society Symposium Series: Symposium on Electroactive Polymers
for Corrosion Control (2001)
66. “Synthesis and Characterization of Water-Soluble Chiral Conducting Polymer Nanocomposites”
P. A. McCarthy, J. Huang, S.C. Yang, H-L. Wang, *Langmuir*, **18**, 259 (2002)
 67. Wenguang Li, Patick A. McCarthy, Dingguo Liu, Jianyu Huang, Sze-Cheng Yang, Hsing-Lin Wang, Toward understanding and optimizing the template-guided synthesis of chiral polyaniline nanocomposites, *Macromolecules*, **35**, 9975-9982 (2002).
 68. “Organic / Inorganic Hybrid Material for Coating on Metals,” Zhexiong Tang, Neil Alvarez and Sze Yang, *Materials Research Society Symposium Proceedings*, **734**, B9.57 (2003).

Proceedings Title: “Polymer/Metal Interfaces and Defect Mediated Phenomena in Ordered Polymers” Editors: Evangelos Manias, George G. Malliaras
 69. The Organic/Inorganic Interface in Micro and Nano Composite Materials, Z. Tang, H. Wan, R. Clark, S. C. Yang, J. Sinko, *Materials Research Society Symposium Proceedings*, **796**, V5.9 (2004).

Proceedings Title: “Critical Interfacial Issues in Thin-Film Optoelectronic and Energy Conversion Devices”, Editors: David S. Ginley, Sue A. Carter, Michael Gratzel, Robert W. Birkmire
 70. “Anticorrosive Coatings Based on Novel Conductive Polymers” S.C. Yang, R. Brown, J. Sinko, *European Coating Journal*, (2005) **11**, 48
 71. “Controlling the pKa for Protonic Doping of Polyaniline by Non-covalent Complexation”, Hui Wan and Sze C Yang; *Materials Research Society Symposium Proceedings*, (2006) *S12.23*.
 72. “Composite Material Prepared by Physical Adsorption of π -conjugated Polymer on Inorganic Particles”. Sze C Yang, Hui Wan and John Sinko, *Materials Research Society Symposium Proceedings*, (2006) *S12.58*