

## ELSA REICHMANIS

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### EDUCATION:

B.S., 1972, Chemistry - Syracuse University  
Ph.D., 1975, Organic Chemistry - Syracuse University

### WORK EXPERIENCE:

2008-present Georgia Institute of Technology, Atlanta, Georgia, *Professor, Chemical and Biomolecular Engineering*  
2006-2007 Bell Laboratories, Alcatel-Lucent, Murray Hill, New Jersey. *Director, Materials for Communications Research Department*  
2001 -2006 Bell Laboratories, Lucent Technologies, Murray Hill, New Jersey. *Director, Materials Research Department.*  
1996 - 2001 Bell Laboratories, Lucent Technologies, Murray Hill, New Jersey. *Director, Polymer and Organic Materials Research Department.*  
1994-1995 AT&T Bell Laboratories, Murray Hill, New Jersey. *Head, Polymer and Organic Materials Research Department.*  
1984 - 1994 AT&T Bell Laboratories, Murray Hill, New Jersey. *Supervisor, Radiation Sensitive and Applications Group.*  
1978 - 1984 AT&T Bell Laboratories, Murray Hill, New Jersey. *Member of Technical Staff, Organic Chemistry Research and Development Department.*  
1976 - 1978 Syracuse University, Syracuse, New York, Dr. Chaim Weizmann Fellow  
1975 – 1976 Syracuse University Postdoctoral Intern  
1973 – 1975 Syracuse University, Syracuse, New York. Syracuse University Research Fellow  
1972 Syracuse University, Syracuse, New York. Teaching Assistant – Organic Chemistry

### AWARDS AND APPOINTMENTS

1972 Phi Beta Kappa  
1986 Member, Japanese Technology Evaluation Program Panel on Advanced Materials sponsored by the National Science Foundation  
1987 Member, Committee to Survey Materials Research Opportunities and Needs for the Electronics Industry sponsored by the National Research Council  
1986 – 1990 American Chemical Society Division of Polymeric Materials: Science and Engineering, Member-at-Large  
1987 – 1990 Member ACS Books Advisory Board  
1991 – 1992 American Chemical Society Division of Polymeric Materials: Science and Engineering, Secretary  
1992 R&D 100 Award for the development of the CAMP-6 deep-UV photoresist  
1993 American Chemical Society Division of Polymeric Materials: Science and Engineering Vice Chairman  
Society of Women Engineers Achievement Award  
1993-1998 Member, National Materials Advisory Board  
1993-present Semiconductor Research Corporation Mentor, Cornell University  
1994 American Chemical Society, Division of Polymeric Materials: Science and Engineering, Chair-Elect  
  
1994-1995 American Chemical Society, Committee on Publications, Associate Member  
1995 American Chemical Society, Division of Polymeric Materials: Science and Engineering, Chair

	Elected to the National Academy of Engineering
	Named AT&T Bell Laboratories Fellow
1995-1997	Member, Chemistry of Materials Editorial Advisory Board
1996	ASM International Engineering Materials Achievement Award
1996-1997	University of Connecticut, Polymer Science Program Advisory Board
1996-2001	Member, U.S. National Committee for the International Union of Pure and Applied Chemistry
1996-present	Member, American Chemical Society Committee on Publications
	Associate Editor, Chemistry of Materials
1997	Fellow of the American Association for the Advancement of Science
1997-2002	Member, American Chemical Society Committee on Science
1998	Photopolymer Science and Technology Award
1998-2002	Member, Air Force Science Advisory Board
1999	ACS Award in Applied Polymer Science
2001	Society of Chemical Industry, Perkin Medalist
2001	Syracuse University, George Arents Pioneer Medal
2002	Fellow, ACS Division of Polymeric Materials: Science and Engineering
2002	President-Elect, American Chemical Society
2002-2005	Member, Journal of the American Chemical Society Editorial Advisory Board
2003	President, American Chemical Society
	George Braude Award, ACS Maryland Local Section
2004	Immediate Past President, American Chemical Society
	National Science Council Distinguished Lecturer, Taiwan 2004
	Meek Lecturer, Department of Chemistry, Ohio State University 2004
2005	Member, NRC Board on Chemical Sciences and Technology
	Mason Lecturer, Department of Chemical Engineering, Stanford University
	Member, NRC Committee on Policy Implication of International Graduate Students and Postdoctoral Scholars in the United States
2005	Elected, Member, Bureau of the Union of Pure and Applied Chemistry
2006	Co-Chair, NRC Board on Chemical Sciences and Technology
2006-present	Member, Chemical Heritage Foundation Board of Directors
2007-2010	Member, Visiting Committee on Advanced Technologies of the National Institute for Standards and Technology

## **PROFESSIONAL SOCIETIES**

American Chemical Society  
 American Physical Society  
 American Association for the Advancement of Science  
 Materials Research Society  
 IEEE  
 SPIE  
 Society of Women Engineers  
 National Academy of Engineering

**EXPERTISE:** Research at the interface of chemistry, materials science, optics, electronics and engineering spanning the range from fundamental concept to technology development and implementation. Has extensive experience in leading cross-cultural, multi-disciplinary research teams from multiple organizations, and generating value for the Intellectual Property through patent and technology license agreements.

Internationally recognized expert in organic and polymer materials design for electronic and photonic applications. Published extensively; organized national and international symposia and conferences; mentored students and post-doctoral fellows; and taught courses.

## **PUBLICATIONS**

1. "(7-Cycloheptatrienyl)-cis<sup>4</sup>-1,3,5,7,-cyclononatetraene", A. G. Anastassiou, E. Reichmanis and R. C. Griffith, *J.C.S. Chem. Commun.*, **913** (1972).
2. "Dioxa and Trioxa Derivatives of C<sub>8</sub>H<sub>8</sub>", A. G. Anastassiou and E. Reichmanis, *J. Org. Chem.*, **38**, 2421 (1973).
3. "The 4,5-Benzazonine System", A. G. Anastassiou, E. Reichmanis and R. L. Elliott, *Tetrahedron Letters*, **3805** (1973).
4. "The 9-Azabarbaralane(9-Azatricyclo[3.3.1.0<sup>2-8</sup>] nona-3,6-diene) Systems", A. G. Anastassiou, A. E. Winston and E. Reichmanis, *J.C.S. Chem. Commun.*, **779** (1973).
5. "3H-3-Benzazonine and the 3-Benzazoninyl Anion", A. G. Anastassiou and E. Reichmanis, *Angew. Chem.*, **86**, 410 (1974) and *Agnew. Chem. Internat. Edit.*, **13**, 404 (1974).
6. "trans-Benzocyclononatetraenyl Anion", A. G. Anastassiou and E. Reichmanis, *Angew. Chem.*, **86** (1974) and *Agnew. Chem. Internat. Edit.*, **13**, 728 (1974).
7. "Effect of Heteratom Electronegativity on the Development of Diatropic Character in cis,trans,cis,trans-Aza[13] annulene", A. G. Anastassiou, R. L. Elliott and E. Reichmanis, *J. Am. Chem. Soc.*, **96**, 7823 (1974).
8. "A Stable trans-Benzazoninyl Anion", A. G. Anastassiou and E. Reichmanis, *J.C.S. Chem. Commun.*, **149** (1975).
9. "The Fuctional Behavior of 9-Heterbarbaralanes", A. G. Anastassiou, E. Reichmanis and J. C. Wetzal, *Tetrahedron Letters*, **1651** (1975).
10. "Cycloadditive Coupling Between 3,6-Diphenyl-s-tetrazine and Selected Biocyclo[6.1.0]nona-2,4,6-trienes; Pericyclic Synthesis of Pyridazinocyclononatetraene and Pyridazinoazonine Frames", A. G. Anastassiou and E. Reichmanis, *J.C.S. Chem. Commun.*, **3.3** (1976).
11. "9H-Azabarbaralane; A  $\pi$ -Destabilized Heterolongicycle", A. G. Anastassiou, E. Reichmanis and A. E. Winston, *Angew. Chem. Internat. Edit.*, **15**, 370 (1976).
12. "An Examination of the Heteronins by Carbon-13 Nuclear Magnetic Resonance", A. G. Anastassiou and E. Reichmanis, *J. Amer. Chem. Soc.*, **98**, 8266 (1976).
13. "An Examination of the 9-Heterobicyclo[4.2.1]nona-2,4,7-trienes by Carbon-13 Nuclear Magnetic Resonance", A. G. Anastassiou and E. Reichmanis, *J. Amer. Chem. Soc.*, **98**, 8267 (1976).
14. "1,2and 1,4 Oxides of Azonine. A Unique Synthetic Entry into N-Substituted 1-Pyridines", A. G. Anastassiou, S. J. Girgenti, R. C. Griffith and E. Reichmanis, *J. Org. Chem.*, **42**, (1977).
15. "Pericyclic Synthesis and Exploratory Photochemistry of Potentially Direct Progenitors of the Unrestricted Hetero[11] Annulene System", A. G. Anastassiou, E. Reichmanis, S. J. Girgenti and M. Schaefer-Ridder, *J. Org. Chem.*, **42**, (1977).
16. "The Development of Aromaticity in the 1-Pyridine System; A Surprising Insensitivity to N-Substitution", A. G. Anastassiou, E. Reichmanis and S. J. Girgenti, *J. Amer Chem. Soc.*, **100** (1978).
17. "The Effect of Sensitizers on the Photodegradation of Poly(methyl methacrylate-co-3-oximino-2-butanone methacrylate)", E. Reichmanis, C. W. Wilkins, Jr. and E. A. Chandross, *J. Electrochem. Soc.*, **127 (11)**, 2514-2517 (1980).
18. "Preliminary Evaluation of Copolymers of Methyl Methacrylate and Acyloximino Methacrylate as Deep-UV Resists", C. W. Wilkins, Jr., E. Reichmanis and E. A. Chandross, *J. Electrochem. Soc.*, **127(11)**, 2510-2513 (1980).
19. "A Novel Approach to o-Nitrobenzyl Photochemistry for Resists", E. Reichmanis, C. W. Wilkins, Jr. and E. A. Chandross, *J. Vac. Sci. Technol.*, **19(4)**, 1338-1342 (1981).

20. "Photoresists for Deep-UV Lithography", E. A. Chandross, E. Reichmanis, C. W. Wilkins, Jr. and R. L. Hartless, *Solid State Technology*, **24(8)**, 81-85 (1981).
21. "Deep-UV Photoresists: A Novel Application of o-Nitrobenzyl Photochemistry", E. Reichmanis, C. W. Wilkins, Jr. and E. A. Chandross, *Microcircuit Engineering Proceedings*, Lausanne, 418-426 (1981).
22. "Bilevel Resist Processing Techniques for Fine Line Lithography", E. Ong, K. Tai, E. Reichmanis and C. W. Wilkins, Jr., *Proceedings, Kodak Microelectronics Seminar*, 91-97 (Oct. 1981).
23. "Radiation Degradation of Copolymers of Methyl Methacrylate and 3-Oximino-2-butanone Methacrylate", T. N. Bowmer, E. Reichmanis, C. W. Wilkins, Jr. and M. Y. Hellman, *J. Poly. Sci. Chem. Ed.*, **20**, 2661-2668 (1982).
24. "Poly(methyl methacrylate-co-3-oximino-2-butanone methacrylate-co-methacrylonitrile): A Deep-UV Photoresist", E. Reichmanis and C. W. Wilkins, Jr., ACS Symposium Series, No. 184, *Polymer Materials for Electronic Applications*, E. D. Feit, C. W. Wilkins, Jr., Eds, 29-43 (1982)
25. "Compositional Analysis of a Terpolymer Photoresist by Raman Spectroscopy", F. J. Purcell, E. Russavage, E. Reichmanis and C. W. Wilkins, Jr., *ibid.* 45-59.
26. "Lithographic Evaluation of an o-Nitrobenzyl Ester-Based Deep-UV Resist System", C. W. Wilkins, Jr., E. Reichmanis and E. A. Chandross, *J. Electrochem. Soc.*, **129(11)**, 2552-2555 (1982).
27. "A Study of the Photochemical Response of o-Nitrobenzyl Cholate Derivatives in P(MMA-MAA) Matrices", E. Reichmanis, R. Gooden, C. W. Wilkins, Jr. and H. Schonhorn, *J. Poly. Sci., Poly. Chem. Ed.* **21**, 1075-1083 (1983).
28. "New Photoresists for Deep-Ultraviolet (<300nm) Exposure", E. A. Chandross, E. Reichmanis, C. W. Wilkins, Jr. and R. L. Hartless, *Can. J. Chem.*, **61(5)**, 817-823 (1983).
29. "Deep-UV Photolithographic Systems and Processes", C. W. Wilkins, Jr., E. Reichmanis, E. A. Chandross and R. L. Hartless, *Poly. Eng. and Sci.*, **23(18)**, 1025-1028 (1983).
30. "Materials for Multilevel Resist Schemes", E. Reichmanis, C. W. Wilkins, Jr. and E. Ong, *Poly. Engin. and Sci.*, **23(18)**, 1039-1042 (1983).
31. "The Effect of Substituents on the Photosensitivity of 2-Nitrobenzyl Ester Deep-UV Resists", E. Reichmanis, C. W. Wilkins, Jr., D. A. Price and E. A. Chandross, *J. Electrochem. Soc.*, **130(6)**, 1433-1437 (1983).
32. "Deep-UV Positive Resists for Two-Level Photoresist Processes", E. Reichmanis and G. Smolinsky, *Proc. SPIE*, Vol. 469, *Advances in Resist Technology*, 38-44 (March, 1984).
33. "An Organosilicon Novolac Resin for Multilevel Resist Applications", C. W. Wilkins, Jr., E. Reichmanis, T. M. Wolf and B. C. Smith, *J. Vac. Sci. Technol.*, **B 3(1)**, 306-309 (1985).
34. "o-Nitrobenzyl Photochemistry: Solution vs. Solid-State Behavior", E. Reichmanis, B. C. Smith and R. Gooden, *J. Poly. Sci., Poly. Chem. Ed.*, **23**, 1-8 (1985).
35. "Oxygen RIE Resistant Deep-UV Positive Resists: Poly(trimethyl-silylethyl methacrylate) and Poly(trimethylsilylmethyl methacrylate-co-3-oximino-2-butanone methacrylate)", E. Reichmanis and G. Smolinsky, *J. Electrochem. Soc.*, **132(5)**, 1178-1182 (1985).
36. "Approaches to Resists for Use in Two-Level, RIE, Pattern-Transfer Applications", E. Reichmanis, G. Smolinsky and C. W. Wilkins, Jr., *Solid State Technol.*, **28(8)**, (1985).
37. "Preparation and Lithographic Properties of Poly(Trimethylsilyl-methyl Methacrylate-co-Chloromethyl Styrene)", A. E. Novembre, E. Reichmanis and M. Davis, *Proc. SPIE*, *Advances in Resist Technology and Processing III*, **631**, 14-21 (1986).
38. "Synthesis and Lithographic Characterization of a Novel Organosilicon Novolac Resin", R. G. Tarascon, A. Shugard and E. Reichmanis, *Proc. SPIE*, *Advances in Resist Technology and Processing III*, **631**, 40-46 (1986).

39. "P(SI-MA)/2-Nitrobenzyl Cholate: A Two-Level Solution-Inhibition Deep-UV Resist System", E. Reichmanis, B. C. Smith, G. Smolinsky and C. W. Wilkins, Jr., *J. Electrochem. Soc.*, **134(3)**, (1987).
40. "Chemical Factors Affecting NPR Performance", R. G. Tarascon, J. Frackoviak, E. Reichmanis and L. F. Thompson, *Proc. SPIE*, "Advances in Resist Technology and Processing IV," **771**, 54 (1987).
41. "Process Parameters for Sub-micron Electron-beam Lithography of NPR", J. Frackoviak, R. G. Tarascon, S. Vaidya and E. Reichmanis, *Proc. SPIE*, "Advances in Resist Technology and Processing IV," **771**, 120 (1987).
42. "Polymer Materials for Microlithography", E. Reichmanis and L. F. Thompson, *Annual Review of Materials Science*, **17**, 235-271 (1987).
43. "New Silicon-Containing Electron-Beam Resist Systems", E. Reichmanis, A. E. Novembre, R. G. Tarascon and A. Shugard in "Polymers for High Technology;" M. J. Bowden and S. Turner, Eds, *ACS Symposium Series*, **346**, 110 (1987).
44. "An Evaluation of Nitrobenzyl Ester Chemistry for Chemical Amplification Resists", F. M. Houlihan, A. Shugard, R. Gooden and E. Reichmanis, *Proc. SPIE*, "Advances in Resist Technology and Processing V," **920**, 67 (1988).
45. "Nitrobenzyl Ester Chemistry for Polymer Processes Involving Chemical Amplification", F. M. Houlihan, A. Shugard, R. Gooden and E. Reichmanis, *Macromolecules*, **21**, 2001 (1988).
46. "Experimental Tests of the Steady-State Model for Oxygen Reactive Ion Etching of Silicon-Containing Polymers", C. W. Jurgensen, A. Shugard, N. Dudash, E. Reichmanis and M. J. Vasile, *Proc. SPIE*, "Advances in Resist Technology and Processing V," **920**, 253 (1988).
47. "Experimental Tests of the Steady-State Model for Oxygen Reactive Ion etching of Silicon-Containing Polymers", C. W. Jurgensen, A. Shugard, N. Dudash, E. Reichmanis and M. J. Vasile, *J. Vac. Sci. Technol. A*, **6 (5)**, 2938 (1988).
48. "Radiation Chemistry of Polymers for Electronic Applications", E. Reichmanis, In "The Effects of Radiation on High-Technology Polymers," E. Reichmanis and J. H. O'Donnell, Eds., *ACS Symposium Series* **381**, American Chemical Society, Washington, DC, 1989, p 132.
49. "Chemistry of Microelectronic Polymers", E. Reichmanis and C. W. Wilkins, Jr., In "Microelectronic Polymers," M. S. Htoo, ed. Marrel Dekker, Inc., New York, 1989, p 1.
50. "Synthesis and Oxygen Reactive Ion Etching of Novolac-Siloxane Block Copolymers", M. J. Jurek, R. G. Tarascon and E. Reichmanis, *Chem. Mater.*, **1**, 319 (1989).
51. "Poly (t-BOC-styrene-sulfone) Based Chemically Amplified Resists for Deep-UV Lithography", R. G. Tarascon, E. Reichmanis, F. M. Houlihan, A. Shugard, and L. F. Thompson, *Polym. Eng. and Sci.*, **29** (13), 850 (1989).
52. "A Sub-0.5 $\mu$ m Bilevel Lithographic Process Using the Deep-UV, Electron-beam Resist P(SI-CMS)", A. E. Novembre, M. J. Jurek, A. Kornblit, E. Reichmanis, *Polym. Eng. and Sci.*, **29** (14), 920 (1989).
53. "GC/MS Study of the Thermolysis and Acidolysis of Poly (t-BOC- $\alpha$ -methylstyrene) Poly (t-BOC styrene) and Poly (t-BOC styrene sulfone)", F. M. Houlihan, E. Reichmanis, R. G. Tarascon, G. N. Taylor, M. Y. Hellman and L. F. Thompson, *Macromolecules*, **22** (7), 2999 (1989).
54. "Deep UV Lithographic Response and Quantum Efficiency Calculations of Poly(Trimethyl- silylmethyl Methacrylate-Chloromethylstyrene) Copolymers", M. J. Jurek, A. E. Novembre, I. P. Heyward, R. Gooden and E. Reichmanis, *Chem. Mater.*, **1**, 509 (1989).
55. "Chemically Amplified Resists: A Lithographic Comparison of Acid Generating Species", T. X. Neenan, F. M. Houlihan, E. Reichmanis, *Proc. SPIE*, "Advances in Resist Technology and Processing VI," **1086**, 2 (1989).
56. "Polymer Materials for Microlithography", E. Reichmanis and L. F. Thompson, *Chemical Reviews*, **89**, 1273 (1989).

57. "Polymers in Microlithography: An Overview", E. Reichmanis and L. F. Thompson, In "Polymers in Microlithography", *ACS Symposium Series* **412**, American Chemical Society, Washington, DC, 1989, p 1.
58. "Chemically Amplified Resists: Effect of Polymer and Acid Generator Structure", F. M. Houlihan, E. Reichmanis, L. F. Thompson, R. G. Tarascon, In "Polymers in Microlithography," *ACS Symposium Series* **412**, American Chemical Society, Washington, DC, 1989, p 39.
59. "Lithographic Evaluation of Novolac-Dimethyl Siloxane Block Copolymers", M. J. Jurek and E. Reichmanis, In "Polymers in Microlithography," *ACS Symposium Series* **412**, American Chemical Society, Washington, DC, 1989, p 158.
60. "The Photo and Thermochemistry of Select 2,6-Dinitrobenzyl Esters in Polymer Matrices: Studies Pertaining to Chemical Amplification and Imaging", T.X. Neenan, F. M. Houlihan, E. Reichmanis, J. M. Kometani, B. J. Bachman, L. F. Thompson, *Macromolecules*, **145** (1990).
61. "Organosilicon Polymers for Microlithographic Applications", E. Reichmanis, A. E. Novembre, R. G. Tarascon, A. Shugard and L. F. Thompson, In "Silicon-Based Polymer Science: A Comprehensive Resource", *ACS Advances in Chemistry Series* **224**, American Chemical Society, Washington, DC, 1990, p.265.
62. "Development of a Chemically Amplified Positive Resist Material (CAMP) for Single Layer Deep-UV Lithography", O. Nalamasu, M. Cheng, J. M. Kometani, S. Vaidya, E. Reichmanis and L. F. Thompson, *Proc. SPIE*, "Advances in Resist Technology and Processing VII," **1262**, 32 (1990).
63. "Investigation of the Exposure and Bake of a Positive Acting Resist with Chemical Amplification", R. A. Ferguson, C. A. Spence, E. Reichmanis, L. F. Thompson A. R. Neureuther, *Proc. SPIE*, "Advances in Resist Technology and Processing VII," **1262**, 412 (1990).
64. "Chemically Amplified Resists: The Chemistry and Lithographic Characteristics of Nitrobenzyl Benzenesulfonate Derivatives", F. M. Houlihan, T. X. Neenan, E. Reichmanis, J. M. Kometani, L. F. Thompson, T. Chin, O. Nalamasu, *J. Photopolymer Sci. and Technol.*, **3**(3), 259 (1990).
65. "Chemistry and Processes for Deep-UV Lithography: Materials for Chemically Amplified Resists", E. Reichmanis, L. F. Thompson, F. M. Houlihan, T. X. Neenan, J. M. Kometani, R. S. Kanga, O. Nalamasu, *Polymers for Microelectronics - Science and Technology*, Kodansha, Tokyo, 1990, p 387.
66. "Synthesis and Lithographic Characterization of Poly(4-t-butoxycarbonyloxystyrene-sulfone)", J. M. Kometani, O. Nalamasu, E. Reichmanis, R. S. Kanga, L. F. Thompson, S. A. Heffner, *J. Vac. Sci. Technol. B*, **8** (6), 1428 (1990).
67. "Characterization of Novel Sulfonic Acid Photogenerating 2-Nitrobenzyl Ester Derivatives", F. M. Houlihan, T. X. Neenan, E. Reichmanis, J. M. Kometani, L. F. Thompson, T. Chin, R. S. Kanga, *J. Vac. Sci. Technol B*, **8** (6), 1461 (1990).
68. "Challenges in Lithographic Materials and Processes", E. Reichmanis and L. F. Thompson, *AT&T Technical Journal*, **69** (6), 32 (1990).
69. "Chemical Amplification Mechanisms for Microlithography", E. Reichmanis, F. M. Houlihan, O. Nalamasu, T. X. Neenan, *Chem. Mater.*, **3**, 394 (1991).
70. "Preliminary Lithographic Characteristics of an All Organic Chemically Amplified Resist Formulation for Single Layer Deep-UV Lithography", O. Nalamasu, E. Reichmanis, M. Cheng, V. Pol, J. M. Kometani, F. M. Houlihan, T. X. Neenan, M. P. Bohrer, D. A. Mixon, L. F. Thompson, C. H. Takemoto, *Proc. SPIE*, **1466**, 13 (1991).
71. "Single Component Chemically Amplified Resist Materials for Electron-beam and X-ray Lithography", A. E. Novembre, W. W. Tai, J. M. Kometani, J. E. Hanson, O. Nalamasu, G. N. Taylor, E. Reichmanis, L. F. Thompson, *Proc. SPIE*, **1466**, 89 (1991).
72. "The Design, Synthesis, Characterization and Use of All Organic, Non-Ionic Photogenerators of Acid", F. M. Houlihan, T. X. Neenan, E. Reichmanis, J. M. Kometani, T. Chin, *Chem. Mater.*, **3**, 462 (1991).
73. "Chemistry and Processes for Deep-UV Resists", E. Reichmanis and L. F. Thompson, *Microelectronic Engineering*, **13**, 3 (1991).

74. "Chemistry and Processes for Deep-UV Resists", E. Reichmanis and L. F. Thompson, *Microelectronic Engineering*, **14**, 215 (1991).
75. "Synthesis and Characterization of Poly (4-t-butoxycarbonyloxystyrene-sulfone)," R. S. Kanga, J. M. Kometani, E. Reichmanis, J. E. Hanson, O. Nalamasu, L. F. Thompson, S. A. Heffner, W. W. Tai, P. Trevor, *Chem. Mater.*, **3**, 660 (1991).
76. "An Overview of Resist Processing for Deep-UV Lithography", O. Nalamasu, M. Cheng, A. G. Timko, V. Pol, E. Reichmanis and L. F. Thompson, *J. Photopolymer Sci. and Technol.*, **4**(3), 229 (1991).
77. "The Synthesis Characterization and Lithographic Behavior of Acid Photogenerating Systems Based Upon 2-Nitrobenzyl Ester Derivatives", T. X. Neenan, F. M. Houlihan, E. Chin, E. Reichmanis and J. M. Kometani, *J. Photopolymer Sci. and Technol.*, **4**(3), 341 (1991).
78. "PTBSS: A High Resolution Single Component Aqueous Base Soluble Chemically Amplified Resist", A. E. Novembre, W. W. Tai, J. M. Kometani, J. E. Hanson, O. Nalamasu, G. N. Taylor, E. Reichmanis and L. F. Thompson, *J. Vac. Sci. Technol. B.*, **9**(6), 3338 (1991).
79. "Process Characteristics of An All-Organic Chemically Amplified Deep-UV Resist", M. Cheng, O. Nalamasu, A. G. Timko, V. Pol, J. M. Kometani, E. Reichmanis and L. F. Thompson, *J. Vac. Sci. Technol. B.*, **9**(6), 3374 (1991).
80. "The Radiation Induced Chemistry of Poly(4-tert-butoxycarbonyloxystyrene-co-sulfur dioxide)", E. Novembre, W. W. Tai, J. M. Kometani, J. E. Hanson, O. Nalamasu, G. N. Taylor, E. Reichmanis and L. F. Thompson, *Chem. Mater.*, **4**, 278 (1992).
81. "Lithographic Properties of Single and Multi-Component Chemically Amplified Resists Based on Copolymers of 4-tert-Butoxycarbonyloxystyrene (TBS) and Sulfur Dioxide (SO<sub>2</sub>)", A. E. Novembre, J. E. Hanson, J. M. Kometani, W. W. Tai, O. Nalamasu, G. N. Taylor, E. Reichmanis, L. F. Thompson and D. Tomes, *Microelectronic Engineering* (1992).
82. "The Synthesis and Evaluation of Copolymers of t-Butoxycarbonyloxystyrene and 2-Nitrobenzylstyrene Sulfonates: Single Component Chemically Amplified Deep-UV Imaging Materials", J. E. Hanson, E. Reichmanis, F. M. Houlihan, T. X. Neenan, *Chem. Mater.*, **4**, 837 (1992).
83. "Chemistry of Polymers for Microlithographic Applications", E. Reichmanis, in *Polymers for Electronic and Photonic Applications*, C. P. Wong, Editor, Academic Press, Boston, (1992).
84. "Characteristics of An Improved Chemically Amplified Deep-UV Positive Resist", O. Nalamasu, J. M. Kometani, M. Cheng, A. G. Timko, and E. Reichmanis, *J. Vac. Sci. Technol.*, **B10**, 2563 (1992).
85. "Arylmethyl Sulfones: A New Class of Photoacid Generators", A. E. Novembre, J. E. Hanson, J. M. Kometani, W. W. Tai, E. Reichmanis and L. F. Thompson, *Polym. Eng. and Sci.*, **32**(20), 1476 (1992).
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87. "Chemically Amplified Resists for Deep-UV Lithography: A New Processing Paradigm", E. Reichmanis, L. F. Thompson, O. Nalamasu, A. Blakeney and S. Slater", *Microlithography World*, **1**(5), 7, (1992).
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