Charles Q. Yang

Department of Textiles, Merchandising and Interiors
305 Dawson Hall
The University of Georgia
Athens, GA 30602

Office (706) 542-4912
Fax (706) 542-4890
(Mobile) (706) 424-2597
Email: cyang@uga.edu

Professional Experiences

Professor, The University of Georgia, Athens, Georgia (1995-present).
Associate Professor, The University of Georgia, Athens, Georgia (1990-1995).
Assistant Professor, Department of Chemistry, Marshall University, Huntington, West Virginia (1987-1990).
Scientist (internship), Perkin-Elmer Corporation, Physical Electronics Laboratory, Eden Prairie, Minnesota (1986).

Education

Ph.D. in analytical chemistry under Professor W. G. Fateley, Kansas State University, Manhattan, Kansas (1987).
M.S. in polymer chemistry, Nanjing University, Nanjing, China (1981).
B.S. in chemistry, Peking University, Beijing, China (1969).

Affiliations

American Chemical Society
The Fiber Society

Honors

Creative Research Medal, the University of Georgia, 1998.
Senior Faculty Award, Gamma Sigma Delta (the Honor Society of Agriculture) University of Georgia Chapter, 2004.
"*Who'sWho in America*", 2006, 2007, 2008, 2009; "*Who'sWho in the World*", 2007-2008, 2009-2010; "*Who'sWho in Science and Engineering*", 2007-2008, 2009-2010; Marquis Who'sWho, New Providence, NJ.
"*Dictionary of International Biography*", 34th edition, 2008, International Biographical Center, Cambridge, UK.

Publications in Peer-Reviewed Journals

(*Corresponding author)

1. Xialing Wu and Charles Q. Yang, "Flame Retardant Finishing of Cotton Fleece: Part VII. Polycarboxylic Acids with Different Numbers of Functional Group", **Cellulose**, in print (DOI: 10.1007/s10570-010-9416-8).

2. Charles Q. Yang*, Qingliang He, Richard E. Lyon and Yuan Hu, "Investigation of Flammability of Textile Fibers Using Micro-scale Combustion Calorimetry", **Polymer Degradation and Stability**, 95, 108-115 (2010).

3. Xinying Cheng and Charles Q. Yang, "Flame Retardant Finishing of Cotton Fleece Fabric: Part V. Oligomers of Maleic Acid Containing Phosphorus", **Fire & Materials**, 33, 365-375 (2009).

4. Qinwen Gao, Quan Zhu*, Yuliang Guo, and Charles Q. Yang, "Formation of Highly Hydrophobic Surfaces on Cotton and Polyester Fabrics Using Silica Nanoparticles and non-Fluorinated Alkylsilane", **Industrial and Engineering Chemistry Research**, 48, 9797-9803 (2009).

5. Xingying Chen and Charles Yang, "Flame Retardant Finishing of Cotton Fleece Fabric: Part VI. Hydroxyl-Functional Organophosphorus Oligomer and 1,2,3,4-Butanetetracarboxylic Acid", **J. Fire Sciences**, 27, 583-600 (2009).

6. Xialing Wu and Charles Q. Yang, "Flame Retardant Finishing of Cotton Fleece. Part IV. Bifunctional Carboxylic Acids", **J. Fire Sciences**, 27, 431-446 (2009).

7. Xinyang Chen and Charles Q. Yang, "Flame Retardant Finishing of Cotton Fleece Using Phosphorus-Containing Oligomers of Maleic Acid," **AATCC Review,** 9 (7), 43-47 (2009).

8. Hui Yang and Charles Q. Yang*, "The Bonding of A Hydroxy-Functional Organophosphorus Oligomer to Nylon Fabric Using DMDHEU and TMM as the Bonding Agents", **Polymer Degradation and Stability,** 94, 1023-1031 (2009).

9. Jinping Guan, Charles Q. Yang and Guoqiang Chen*, "Nonformaldehyde Flame Retardant Finishing of Silk Using a Hydroxy-functional Organophosphorus Oligomer", **Polymer Degradation and Stability**, 94, 450-455 (2009).

10. X. Wu and C. Q. Yang, "Flame Retardant Finishing of Cotton Fleece Fabric: Part III. The Combination of Maleic Acid and Sodium Hypophosphite", **J. Fire Sciences**, 26, 351-368 (2008).

11. H. Yang and C. Q. Yang, "Flame Retardant Performance of the Nylon/Cotton Blend Fabric Treated by a Hydroxy-Functional Organophosphorus Oligomer", **Industrial and**

Engineering Chemistry Research, 47, 2160-2165 (2008).

12. X. Wu and C. Yang, "Flame Retardant Finishing of Cotton Fleece. Part II. Phosphorus-Containing Inorganic Compounds", **J. Applied Polymer Sciences,** 108, 1582-1590 (2008).

13. X. Wu and C. Q. Yang, "Flame Retardant Finishing of Cotton Fleece Fabric Using Maleic Acid and Sodium Hypophosphite", **AATCC Review**, 7(12), 35-41 (2007).

14. H. Yang, C. Q. Yang*, "Nonformaldehyde Durable Flame-Retardant Finishing of Nomex/Cotton Blend Using a Hydroxyl-Functional Organophosphorus Oligomer and 1,2,3,4-Butanetetracarboxylic Acid", **Journal of Fire Science**, 25, 425-446 (2007).

15. W. Wu, C. Q. Yang*, "A Comparative Study of Different Organophosphorus Flame Retardant Agents for Cotton: Part II. The Fabric Flammability and Physical Properties", **Polymer Degradation and Stabilization**, 91, 363-369 (2007).

16. C. Yang*, Xiaoqun Qiu, "Flame Retardant Finishing of Cotton Fleece: Part I. the Use of A Hydroxy-Functional Organophosphorus Oligomer and DMDHEU", **Fire and Materials**, 31, 67-81 (2007).

17. G. G. Xu, C. Q. Yang*, Y. Deng, "Mechanism of Paper Wet Strength Development by Polycarboxylic Acids and Poly(vinyl alcohol)/Glutaraldehyde", **Journal of Applied Polymer Science,** 101, 277-284 (2006).

18. W. Wu, C. Q. Yang*, "A Comparative Study of Different Organophosphorus Flame Retardant Agents for Cotton: Part I. The Covalent Bonding of the Flame Retardant Agent to Cotton", **Polymer Degradation and Stabilization**, 91, 2541-2548 (2006).

19. D. Chen, C. Q. Yang*, X. Qiu, "Aqueous Polymerization of Maleic Acid and Crosslinking of Cotton Cellulose by the Poly(maleic Acid)", **Industrial and Engineering Chemistry Research**, 44, 7921-7927 (2005).

20. X. Qiu, C. Q. Yang*, "Evaluation of the Wrinkle Recovery Properties of Durable Press Finished Cotton Fabrics: Wrinkle Recovery Angle versus Wrinkle Recovery Appearance Rating", **AATCC Review, 5(12),** 34-38 (2005).

21. H. Yang, C. Q. Yang*, "Durable Flame-Retardant Finishing of the Nylon/Cotton Blend Fabric Using a Hydroxyl-Functional Organophosphorus Oligomer", **Polymer Degradation and Stabilization***,* 88, 363-370 (2005).

22. C. Q. Yang*, W. Wu, Y. Xu, "The Combination of A Hydroxy-Functional Organophosphorus Oligomer and Melamine-Formaldehyde as A Flame Retarding Finishing System for Cotton", **Fire and Materials**, 29, 109-120 (2005).

23. W. Chen, G. C. Lickfield*, C. Q. Yang, "Molecular Modeling of Cellulose in Amorphous

State, Part II. Effects of Rigid and Flexible Crosslinks on Cellulose", **Polymer**, 45, 1063-1071 (2004).

24. W. Chen, G. C. Lickfield*, C. Q. Yang, "Molecular Modeling of Cellulose in Amorphous State, Part I. Model Building and Plastic Deformation Study", **Polymer**, 45, 1063-1071 (2004).

25. G. G. Xu, C. Q. Yang*, Y. Deng, "Combination of Bifunctional Aldehydes and Poly(vinyl alcohol) As Crosslinking Systems to Improve Paper Wet Strength: A Comparative Study", **Journal of Applied Polymer Science**, 93, 1673-1680 (2004).

26. W. Wu, C. Q. Yang* "Statistical Analysis of the Performance of the Flame Retarding Finishing System Consisting of a Hydroxy-Functional Organophosphorus Oligomer and the Mixture of DMDHEU and Melamine-Formaldehyde Resin", **Polymer Degradation and Stability**, 85, 623-632 (2004).

27. W. Wu, C. Q. Yang*, "Comparison of DMDHEU and Melamine-Formaldehyde As the Binding Agents for A Hydroxy-Functional Organophosphorus Flame Retarding Agent on Cotton", **Journal of Fire Sciences**, 22, 125-142 (2004).

28. W. Zhou, C. Q. Yang*, G. C. Lickfield, "Mechanical Strength of Durable Press Finished Cotton Fabric, Part V: Poly(vinyl alcohol) as An Additive to Improve Abrasion Resistance", **Journal of Applied Polymer Science**, 91, 3940-3946 (2004).

29. W. Wu, X. Zhen, C. Q. Yang*, "Correlation Between Limited Oxygen Index and Phosphorus Content of the Cotton Fabric Treated with a Hydroxyl-functional Organophosphorus Flame Retardant Finish and Melamine-formaldehyde", **Journal of Fire Sciences**, 22, 11-23 (2004).

30. C. Q. Yang*, C. Hu, G. C. Lickfield, "Crosslinking Cotton with Poly(itaconic acid) and in situ polymerization of Itaconic Acid: Fabric Mechanical Strength Retention", **Journal of Applied Polymer Science,** 87, 2023-2030 (2003).

31. J. K. Stowell, C. Q. Yang, "A Durable Low-Formaldehyde Flame Retardant Finish for Cotton Fabrics", **AATCC Review**, 3(2), 17-20 (2003).

32. C. Q. Yang*, W. Wu, "Combination of A Hydroxylalkyl-Functional Organophorus Oligomer and A Multifunctional Carboxylic Acid As A Flame Retardant Finishing System for Cotton: Part I. The Chemical Reactions", **Fire and Materials**, 27, 223-237 (2003).

33. C. Q. Yang*, W. Wu, "Combination of A Hydroxylalkyl-Functional Organophorus Oligomer and A Multifunctional Carboxylic Acid As A Flame Retardant Finishing System for Cotton: Part II. Formation of Calcium Salt during Laundering and Its Suppression", **Fire and Materials**, 27, 239-251 (2003).

34. W. Wu, C. Q. Yang*, "Correlation Between Limited Oxygen Index and Phosphorus/Nitrogen Content of the Cotton Fabric Treated with A Hydroxyl-Functional Organophosphorus Flame Retardant Agent and DMDHEU", **Journal of Applied Polymer Science**, 90, 1885-1890 (2003).

35. C. Q. Yang*, W. Zhou, G. C. Lickfield, K. Parachura, "Cellulase Treatment of Durable Press Finished Cotton Fabric: Effects on Fabric Strength, Abrasion Resistance and Handle", **Textile Research Journal**, 73, 1057-1062 (2003).

36. G. G. Xu, C. Q. Yang*, Y. Deng, "Applications of Dialdehydes to Improve Paper Wet Strength", **Journal of Applied Polymer Science**, 83, 2539-2547 (2002).

37. C. Q. Yang*, Y. Lu, G. G. Lickfield, "Chemical Analysis of 1,2,3,4-Butanetetracarboxylic Acid", **Textile Research Journal**, 72, 817-824 (2002).

38. G. G. Xu, C. Q. Yang*, "Applications of Glutaraldehyde and Poly(vinyl Alcohol) to Improve Paper Performance", **TAPPI Journal**, 84(6), (2001).

39. Z. Mao, C. Q. Yang*, "Infrared Spectroscopy Studies of the Cyclic Anhydride as the Intermediate for the Ester Crosslinking of Cotton Cellulose by Polycarboxylic Acids: V. Comparison of 1,2,4-Butanetricarboxylic Acid and 1,2,3-Propanetricarboxylic acid", **Journal of Applied Polymer Science**, 81, 2142-2150 (2001).

40. C. Q. Yang*, L. Qian, G. C. Lickfield, "Mechanical Strength of Durable Press Finished Cotton Fabric: Part IV. the Abrasion Resistance", **Textile Research Journal**, 71, 543-548 (2001).

41. C. Q. Yang, "FT-IR Spectroscopy Study of the Catalysis for Ester Crosslinking of Cotton Cellulose Catalyzed by Sodium Hypophosphite", **Textile Research Jou**rnal, 71(3), 201-206 (2001).

42. G. G. Xu, C. Q. Yang*, Y. Deng, "Effects of Poly(vinyl alcohol) on the Strength of the Kraft Paper Crosslinked by A Polymeric Carboxylic Acid", **Journal of Paper and Pulp Science**, 27(1), 14-17 (2001).

43. Z. Mao, C. Q. Yang*, "Polymeric Multifunctional Carboxylic Acids as Crosslinking Agents for Cotton Cellulose: Poly(itaconic acid) and in-situ Polymerization of Itaconic Acid", **Journal of Applied Polymer Science,** 79, 319-326 (2001).

44. Z. Yan, Y. Deng*, D. Zhang, C. Q. Yang, "Characterization of Cationic Copolymers of Butylacrylate and [3-(Methacrylolamino)-propyl]trimethylammonium Chloride", **Journal of Polymer Science, Part A. Polymer Chemistry**, 39, 1031-1039 (2001).

45. C. Q. Yang*, X. Gu, "A New Redox Initiation System and Polymerization of Maleic Acid Studied by FT-Raman Spectroscopy", **Journal of Applied Polymer Science**, 81, 223-228

(2001).

46. C. Yang*, G. Zhang, "FT-IR and FT-Raman Spectroscopy Study of the Cyclic Anhydride Intermediates for the Esterification of Cellulose: III. Cyclic Anhydrides Formed by the Isomers of Cyclohexanedicarboxylic Acid", **Research on Chemical Intermediates,** 26, 515-528 (2000).

47. C. Q. Yang*, Z. Mao, G. C. Lickfield, "Ester Crosslinking of Cotton Cellulose by Polycarboxylic Acids: the pH-Dependency", **Textile Chemist and Colorist**, 32 (11), 43-46 (2000).

48. C. Q. Yang*, W. Wei, G. C. Lickfield, "Mechanical Strength of Durable Press Finished Cotton Fabric: Part III. Change in Cellulose Molecular Weight", **Textile Research Journal**, 70, 910-915(2000).

49. C. Q. Yang*, D. Wang, "Evaluation of Ester Crosslinking of Cotton Cellulose by A Polycarboxylic Acid Using Acid-Base Titration**", Textile Research Journal**, 70, 615-620 (2000).

50. C. Q. Yang*, Y. Lu, "In-situ Polymerization of Maleic Acid and Itaconic Acid on Cotton Studied by MALDI/TOF Mass Spectroscopy and A Multiple Angle Light-Scattering Photometer", **Textile Research Journal**, 70, 359-362 (2000).

51. C. Q. Yang*, W. Wei, "Evaluation of Glutaraldehyde as A Nonformaldehyde Durable Press Finishing Agent for Cotton Fabrics", **Textile Research Journal**, 70, 230-236 (2000).

52. C. Q. Yang*, X. Wang, Y. Lu, "Infrared Spectroscopy Studies of the Cyclic Anhydride as the Intermediate for the Ester Crosslinking of Cotton Cellulose by Polycarboxylic Acids: IV. In-situ Polymerization of Maleic Acid and Itaconic Acid on Cotton Fabric", **Journal of Applied Polymer Science**, 75, 327-336 (2000).

53. X. Gu, C. Yang*, "FT-IR Study of the Formation of Cyclic Anhydride Intermediates of Polycarboxylic Acids Catalyzed by Sodium Hypophosphite", **Textile Research Journal**, 70, 64-70 (2000).

54. C. Q. Yang*, W. Wei, "The Mechanical Strength of Durable Press Finished Cotton Fabrics: Part II. Comparison of Crosslinking Agents with Different Molecular Structures", **Textile Research Journal**, 70, 143-147 (2000)

55. W. Wei, C. Q. Yang*, "Polymeric Carboxylic Acid and Citric Acid as A Nonformaldehyde Durable Press Finish", **Textile Chemist and Colorist**, 32(2), 53-57 (2000).

56. C. Q. Yang*, X. Gu, "FT-IR and FT-Raman Spectroscopy Study of the Cyclic Anhydride Intermediates for the Esterification of Cellulose: II. Formation of Anhydride with Sodium Hypophosphite as a catalyst", **Research on Chemical Intermediates**, 25(5), 411-424

(1999).

57. Y. Lu, C. Q. Yang*, “In-situ Polymerization of Maleic Acid and Itaconic Acid and Crosslinking of Cotton Fabric”, **Textile Research Journal**, 69(10), 685-690 (1999).

58. Y. Xu, C. Yang*, C. Chen, "Wet Reinforcement of Paper with High Molecular Weight Multifunctional Carboxylic Acids”, **TAPPI Journal**, 82(8), 150-156(1999).

59. G. Xu, C. Q. Yang*, “Comparison of Polymeric Carboxylic Acids of Different Molecular Weight for Improving Paper Strength”, **Journal of Applied Polymer Science**, 74, 907-912 (1999).

60. Y. Lu, C. Q. Yang*, "Fabric Yellowing Caused by Citric Acid as A Crosslinking Agent for Cotton”, **Textile Research Journal**, 69(9), 685-690(1999).

61. C. Q. Yang*, “Durable Press Garment Finishing without Formaldehyde”, **American Dyestuff Reporter**, 88(5), 13-17 (1999).

62. W. Wei, C. Q. Yang*, "Predicting the Performance of the Durable Press Finished Cotton Fabric Using Infrared Spectroscopy", **Textile Research Journal**, 69, 145-151 (1999).

63. W. Wei, C. Q. Yang*, Y. Jiang, "Nonformaldehyde Durable Press Garment Finishing of Cotton Slacks", **Textile Chemist and Colorist**, 31(1), 34-38 (1999).

64. X. Gu, C. Yang*, “FT-IR and FT-Raman Spectroscopy Study of the Cyclic Anhydride Intermediates for the Esterification of Cellulose: I. Formation of Anhydride without A Catalyst”, **Research on Chemical Intermediates**, 24, 979-997 (1998).

65. C. Q. Yang,* X. Wang, "The Formation of Five Membered Cyclic Anhydride Intermediates by Polycarboxylic Acids Studied by the Combination of Thermal Analysis and FT-IR Spectroscopy", **Journal of Applied Polymer Science**, 70, 2711-2718 (1998).

66. Y. Xu, C. Chen, C. Q. Yang*, "Applications of Polymeric Carboxylic Acids for Improving Paper Wet Performance**", TAPPI J**., 81(11), 159-164 (1998).

67. I. Kang, C. Q. Yang*, W. Wei, G. C. Lickfield, "The Mechanical Strength of the Cotton Fabrics Crosslinked by Polycarboxylic Acids: Part I. Acid Degradation and Crosslinking of Cellulose", **Textile Research Journal**, 68, 865-870 (1998).

68. Q. Yang*, L. Xu, S. Li, and Y. Jiang, "Nonformaldehyde Durable Press Finishing of Cotton Fabrics by Combining Polymers of Maleic Acid with Citric Acid", **Textile Research Journal**, 68, 457-464(1998).

69. C. Q. Yang*, Y. Xu, “Paper Wet Performance and Ester Crosslinking of Wood Pulp Cellulose by Different Polycarboxylic Acids”, **Journal of Applied Polymer Science**, 67,

649-658 (1998).

70. C. Q. Yang*, X. Wang, "Infrared Spectroscopy Studies of the Cyclic Anhydride as the Intermediate for the Ester Crosslinking of Cotton Cellulose by Polycarboxylic Acids: III. the Molecular Weight of A Crosslinking Agent", **Journal of Polymer Science, Part A: Polymer Chemistry,** 35, 557-564 (1997).

71. C. Q. Yang*, X. Wang, I. Kang, "Ester Crosslinking Cotton Fabric by the Polymers of Maleic Acid and Citric Acid", **Textile Research Journal,** 67, 334-342 (1997).

72. C. Q. Yang*, Y. Xu, D. Wang, "FT-IR Spectroscopy Study of the Polycarboxylic Acids Used for Paper Wet Strength Improvement", **Industry and Engineering Chemistry Research**, 35, 4037-4042 (1996).

73. C. Q. Yang*, G. D. Bakshi, "Quantitative Analysis of the Nonformaldehyde Durable Press Finish on Cotton Fabric: Acid-Base Titration and Infrared Spectroscopy", **Textile Research Journal**, 66, 377-384(1996).

74. C. Q. Yang*, X. Wang, "Formation of the Cyclic Anhydride Intermediates and Esterification of Cotton Cellulose by Multifunctional Carboxylic Acids: An Infrared Spectroscopy Study", **Textile Research Journal**, 66, 595-603(1996).

75. C. Q. Yang*, X. Wang, "Infrared Spectroscopy Studies of the Cyclic Anhydride as the Intermediate for the Ester Crosslinking of Cotton Cellulose by Polycarboxylic Acids: II. Comparison of Different Polycarboxylic Acids", **Journal of Polymer Science, Part A: Polymer Chemistry,** 34, 1537-1580 (1996).

76. C. Q. Yang*, J. R. Simms, "Comparison of Photoacoustic, Diffuse Reflectance and Transmission Infrared Spectroscopy for the Studies of Carbon Fibers", **Fuel**, 74, 543-548 (1995).

77. C. Q. Yang*, "Identification of Yarn Contamination Using Extraction and Difference Infrared Spectroscopy", **Industrial and Engineering Chemistry Research**, 33,2836-2839 (1994).

78. C. Q. Yang*, L. Martin, "Studies of Thermal and Photo Oxidation of Nonwoven Polypropylene Fabrics Using FT-IR Spectroscopy," **Journal of Applied Polymer Science**, 51, 389-397 (1994).

79. J. R. Simms, C. Q. Yang*, "Infrared Spectroscopy Studies of the Petroleum Pitch Carbon Fiber: II. The Distribution of the Oxidation Products between the Surface and the Bulk", **Carbon**, 32, 621-626 (1994).

80. L. Martin, C. Q. Yang*, "Infrared Spectroscopy Studies of the Photooxidation of the Nonwoven Polyethylene Fabric", **Journal of Environmental Polymer Degradation**, 2,

153-160 (1994).

81. C. Q. Yang*, "Infrared Spectroscopy Studies of the Cyclic Anhydride as the Intermediate for the Ester Crosslinking of Cotton Cellulose by Polycarboxylic Acids: I. Identification of the Cyclic Anhydride Intermediate", **Journal of Polymer Science, Part A: Polymer Chemistry**, 33, 1187-1193 (1993).

82. C. Q. Yang*, J. R. Simms, "Infrared Spectroscopy Studies of the Petroleum Pitch Carbon Fiber: I. The Raw materials, the Stabilization and Carbonization Process", **Carbon**, 33, 451-459 (1993).

83. C. Q. Yang*, "The Effect of pH on the Nonformaldehyde Durable Press Finishing of Cotton Fabrics Studied by FT-IR Spectroscopy: I. The Ester Crosslinking", **Textile Research Journal**, 63, 420-431 (1993).

84. C. Q. Yang*, "The Effect of pH on the Nonformaldehyde Durable Press Finishing of Cotton Fabrics Studied by FT-IR Spectroscopy: II. The Formation of the Anhydride Intermediate", **Textile Research Journal**, 63, 706-711 (1993).

85. C. Q. Yang*, "Infrared Spectroscopy Studies of the Effects of Catalyst on the Ester Crosslinking of Cotton Cellulose by Polycarboxylic Acids", **Journal of Applied Polymer Science**, 50, 2047-2053 (1993).

86. C. Q. Yang*, "Infrared Spectroscopic Studies of Textile Materials Degradation Using Photoacoustic Detection," **Industrial and Engineering Chemistry Research**, 31, 617-621 (1992).

87. C. Q. Yang*, "Comparison of Fourier Transform Photoacoustic and Diffuse Reflectance Spectroscopy as Near-Surface Analysis Techniques," **Applied Spectroscopy**, 45, 102-108 (1991).

88. C. Q. Yang*, "Characterizing the Ester Cross-Linkages of Cotton Cellulose With FT-IR Photoacoustic Spectroscopy," **Textile Research Journal**, 61, 298-305 (1991).

89. C. Q. Yang*, "FT-IR Spectroscopy Study of the Ester Cross-linking Mechanism of Cotton Cellulose," **Textile Research Journal**, 61, 433-440 (1991).

90. C.Q. Yang*, B. A. K. Andrews, "Infrared Spectroscopic Studies of the Nonformaldehyde Durable Press Finishing of Cotton Fabrics by Polycarboxylic Acids," **Journal of Applied Polymer Science**, 43, 1609-1616 (1991).

91. C.Q. Yang*, James M. Freeman, "Photo Oxidation of Cotton Cellulose Studied by FT-IR Photoacoustic Spectroscopy," **Applied Spectroscopy**, 45,1695-1698 (1991).

92. C.Q. Yang*, R. R. Bresee, W. G. Fateley, "Studies of Chemically Modified Poly(ethylene

terephthalate) Fibers by FT-IR Photoacoustic Spectroscopy and X-ray Photoelectron Spectroscopy," **Applied Spectroscopy**, 44, 1035-1039 (1990).

93. C. Q. Yang*, T. A. Perenich, W.G. Fateley, "Studies of Foam Finished Cotton Fabrics by FT-IR Photoacoustic Spectroscopy," **Textile Research Journal**, 59, 562-568, (1989).

94. C. Q. Yang*, J. F. Moulder, W. G. Fateley, "XPS Studies of the Bonding and Hydrolysis of Di(dicotyl)pyro-phosphate Ethylene Titanate Coupling Agent on Metal Surfaces," **Journal of Adhesion Science and Technology**, 2, 11-19 (1988).

95. C. Q. Yang*, R. R. Bresee, W. G. Fateley, "Near Surface Analysis and Depth Profiling by FT-IR Photoacoustic Spectroscopy," **Applied Spectroscopy**, 41, 889-896 (1987).

96. C. Q. Yang*, W. G. Fateley, "Fourier-Transform Infrared Photoacoustic Spectroscopy Evaluated for Near Surface Characterization of Polymeric Materials", **Analytical Chimica Acta**, 194, 303-309 (1987)

97. C. Q. Yang* and Randall R. Bresee, "Studies of Sized Cotton Yarns by FT-IR Photoacoustic Spectroscopy," **Journal of Coated Fabrics**, 17, 110-128 (1987).

98. C. Q. Yang*, "The AES Studies of the Interfacial Cross-Linking of the Chromium (III) Fumarato Coupling Agent in the Formation of the Aluminum- Polyethylene Composite Film," **Materials Chemistry and Physics**, 15, 401-414 (1986).

99. C. Q. Yang*, W. G. Fateley, "The Effect of Particle Size on Peak Intensities of FT-IR Photoacoustic Spectra", **Journal of Molecular Structure**, 141, 279-284 (1986).

100. C. Q. Yang*, W. G. Fateley, "The Effect of Particle Size on FT-IR Photoacoustic Spectra," **Journal of Molecular Structure**, 146, 25-39 (1986).

101. C. Q. Yang*, Q. Zhou, "The interfacial Diffusion of Chromium (III) Fumarato Coordination Compound in the Formation of Aluminum-Polyethylene Composite Film**,**" **Applied Surface Sciences**, 24, 213-224 (1985).

Publications as Book Chapters (Peer-Reviewed)

1. C. Q. Yang*, X. Wang, “Applications of FT-IR Spectroscopy to the Studies of Esterification and Crosslinking of Cellulose by Polycarboxylic Acids: Part I. Formation of Cyclic Anhydrides as the Reactive Intermediates”, in “*Fourier Transform Spectroscopy: Eleventh International Conference*”, Jams A. De Haseth, Ed., America Institute of Physics, Woodbury, New York, 1998, pp661-664.

2. C. Q. Yang*, W. Wei, “Applications of FT-IR Spectroscopy to the Studies of Esterification and Crosslinking of Cellulose by Polycarboxylic Acids: Part II. The Performance of the Crosslinked Cotton Fabrics”, in “*Fourier Transform Spectroscopy: Eleventh International Conference*”, Jams A. De Haseth, Ed., America Institute of Physics, Woodbury, New York, 1998, pp665-669.

3. S. A. Bhat, C. Q. Yang, J. A. De Haseth*, “Study of Ester Crosslinking Reactions on Aluminum Surfaces by Infrared Attenuated Total Reflectance Spectroscopy”, in “Fourier Transform Spectroscopy: Eleventh International Conference”, Jams A. De Haseth, Ed., America Institute of Physics, Woodbury, New York, 1998, pp543-547.

4. C. Q. Yang*, J. M. Freeman, "Thermal Degradation of Cotton Cellulose Studied by FT-IR Photoacoustic Spectroscopy," in "*Advances in Chemistry Series 236, Structure-Property Relations in Polymers*", Ed. M. W. Urban and C. D. Craver, American Chemical Society, Washington, D.C., pp693-708 (1993).

5. C. Q. Yang*, T. W. Rusch, S. P. Clough, W. G. Fateley, "The Bonding and Hydrolysis of the Cr(III) Fumarato Coupling Agent on Aluminum Surfaces Studied by Auger Electron Spectroscopy and X-ray Photoelectron Spectroscopy," in “*Adhesives, Sealants and Coatings for Space***”**, L. H. Lee, Ed., Plenum, New York, pp153-164 (1988).

6. C. Q. Yang*, R. R. Bresee, W. G. Fateley and T. A. Perenich, "Studies of Cellulose Textile Materials by using FT-IR/PAS," in “*ACS Symposium Series 340, the Structures of Cellulose*", R. H. Atalla, Ed., American Chemical Society, Washington, DC, pp214-232 (1987).

7. Q. Yang* and Q. Zhou, "The ESCA and AES Studies of the Interfacial Chemical Bonding Between Aluminum and Chromium (III) Fumarato Coordination Compound," in “*Polymer Science and Technology***”**, Vol 29, L.H. Lee, Ed., Plenum, New York, pp799-819 (1984).

Patents

1. Charles Q. Yang, " Flame Retarding System for Nylon Fabrics", **U. S. Patent Application Publication**, US 2006/0202175 A1, September 14, 2006. (One claim approved in April 2008, other claims pending).

2. J. K. Stowell, E. D. Weil, W. L. Coble, C. Q. Yang, "Formaldehyde-Free Flame Retardant Treatment for Cellulose-Containing Materials", **Korean Patent 701717**, March 23, 2007, assigned to the University of Georgia Research Foundation and Supresta LLC.

3. Charles Q. Yang, Weidong Wu, Jeffery K. Stowell and Edward D. Weil, "A Durable Flame Retardant Finish of Cellulose Materials", **UK Patent GB 2,406,103B**, assigned to the University of Georgia Research Foundation and Akzo Nobel N.V., May 4, 2006.

4. Charles Q. Yang, "Catalyst Systems and Method for Preparing Flame Resistance Materials", **U.S. Patent Application Publication US2004/0261191 A1**, December 30, 2004; PCT International Publication Number **WO 2003/072871**, September 4, 2003.

5. Charles Q. Yang and Guozhong Xu, "Polymer-Aldehyde Additives to Improve paper Properties", **U.S. Patent 6,379,499 B1,** assigned to the University of Georgia Research Foundation, April 30, 2002.

6. Jeffery K. Stowell, Edward D. Weil, William L. Coble, Charles Q. Yang, "Formaldehyde-Free Flame Retardant Treatment for Cellulose-Containing Materials", **U.S. Patent 6,365,070 B1**, April 2, 2002, assigned to Akzo Nobel and the University of Georgia Research Foundation.

7. Jeffery K. Stowell, Edward D. Weil, William L. Coble, Charles Q. Yang, "Formaldehyde-Free Flame Retardant Treatment for Cellulose-Containing Materials", **U.S. Patent 6,309,565 B1**, assigned to Akzo Nobel and the University of Georgia Research Foundation, Oct. 30, 2001.

8. Charles Q. Yang, "Cross linking Agents of Cellulose Fabrics", **U.S. Patent 6,165,919**, assigned to University of Georgia Foundation, December 26, 2000. The following foreign patents have been issued for the same technology:

   Singapore Patent 66,600, issued July 24, 2001.
   Japan Patent 2001-568,139, issued June 19, 2001.
   Turkey Patent 19,990,168, issued March 21, 2001.
   Egypt Patent 21,225, issued November 29, 2000.
   South Africa Patent 98/0272, issued September 30, 1998.
   Pakistan Patent 136,098, issued January 12, 1998

.

Publications in Conference Proceedings

1. Charles Q. Yang*, Qingliang He, "Investigation of the Flammability of Different Textile Fibers Using Microscale Combustion Calorimetry", "**Proceedings of the 9th Autex (Association of the Universities if Textiles) Conference**" (CD), Autex, pp591-602, 2009.

2. Charles Q. Yang and Xialing Wu, "Flame Retardant Finishing of Cotton Fleece Using Non-traditional Flame Retardants", "**Proceedings of 19th Annual BCC Conference on Flame Retardancy of Polymeric Materials**", Business Communication Corporation, Stamford, Connecticut, pp 264-277, 2009.

3. C. Q. Yang and X. Wu, "Flame Retardant Finishing of Cotton Fleece by Multi-Functional Carboxylic Acids: Performance of Different Acids", **Proceedings of 2009 AATCC International Conference**" (CD), AATCC, Research Triangle Park, North Carolina, 2009.

4. C. Q. Yang, D. Yang, E. Weil, "Flame Retardant Textiles in China", **Proceedings of 2009 AATCC International Conference**" (CD), AATCC, Research Triangle Park, North Carolina, 2009.

5. X. Chen and C. Q. Yang, "Flame Retardant Finishing of Cotton Fleece Using Phosphorus-containing polycarboxylic Acids", **Proceedings of 2009 AATCC International Conference**" (CD), AATCC, Research Triangle Park, North Carolina, 2009.

6. C. Q. Yang, D. Chen and X. Wu, "Nonformaldehyde Durable Press Finishing of Cotton Using Multifunctional Carboxylic Acids: Recent Development", in "**Proceedings of 7th Autex (Association of Universities for Textiles) Conference"**(CD), Autex, 2008**.**

7. C. Q. Yang, "New Development in Functional Finishing of Cotton Textiles" (plenary lecture), "**Book of Proceedings, 4th International Textile, Clothing & Design Conference**", Ed. Z. Dragcevic, Faculty of Textile Technology, University of Zagreb, Croatia, 2008, pp 3-21.

8. C. Q. Yang and H. Yang, "Flame Retardant Finishing of Nylon/Cotton, Blend Fabrics for Military Uniforms," "**Book of Proceedings, 4th International Textile, Clothing & Design Conference**", Ed. Z. Dragcevic, Faculty of Textile Technology, University of Zagreb, Croatia, 2008, pp 487-492.

9. C. Q. Yang and X. Wu, "Innovative Finishing Methods for Cotton Fleece Using Non-traditional Phosphorus-Containing Flame Retardants," "**Book of Proceedings, 4th International Textile, Clothing & Design Conference**", Ed. Z. Dragcevic, Faculty of Textile Technology, University of Zagreb, Croatia, 2008, pp 493-498.

10. C. Q. Yang and H. Yang, "Flame Retardant Nylon/Cotton Blend Military Fabrics Using Hydroxy-functional Organophosphorus Oligomer", "**Proceedings of 19th Annual BCC Conference on Flame Retardancy of Polymeric Materials**", Business Communication Corporation, Stamford, Connecticut, 2008, pp246-258..

11. E. D. Weil and C. Q. Yang, "Textile Flame Retardancy – State of the Are and Recent Progresses", "**Proceedings of 19th Annual BCC Conference on Flame Retardancy of Polymeric Materials**", Business Communication Corporation, Stamford, Connecticut, 2008, pp259-270.

12. C. Q. Yang, "the New Development in Flame Retardant Finishing of Nomex Cotton and Nylon/Cotton Blend Fabrics for Protective Clothing", in "**Proceedings of 2008 National Symposium on High Technology Fibrous Materials and Protective Clothing**", China National Protective Clothing Society, Beijing, China, 2008, pp45-56.

13. Charles Q. Yang and Hui Yang, "The Bonding of a Hydroxyl-Functional Organophosphorus Oligomer onto nylon and Flame Retardant Finishing of Nylon/Cotton Blend Fabric", in "**Proceedings of 2007 AATCC International Conference**", AATCC, Research Triangle Park, North Carolina, 2007, pp84-91.

14. X. Wu and C. Yang, "Flame Retardant Finishing of Cotton Fleece using Maleic acid and Sodium Hypophosphite", in "**Proceedings of 2007 AATCC International Conference**", AATCC, Research Triangle Park, North Carolina, 2007, pp32-41.

15. Hui Yang and Charles Q. Yang, "A New Flame Retardant Finished Nomex/Cotton Blend Fabric for Protective Clothing", in **"Proceedings of 18th Annual BCC Conference on Flame Retardancy of Polymeric Materials**", Business Communication Corporation, Stamford, Connecticut, 2007.

16. Hui Yang and Charles Q. Yang, "New Organophosphorus Flame Retardant Finishing Systems for Cotton Blends Used for Military Protective Clothing", in **"Proceedings of 7th Autex (Association of Universities for Textiles) Conference**", Tampere University of Technology, Tempere, Finland (CD).

17. Charles Q. Yang, Xialing Wu and Xiaoqun Qiu, "Fame Retardant Finishing of Cotton Fleece Fabrics Using Phosphorus and Nonphosphorus Chemicals," in **"Proceedings of 17th Annual BCC Conference on Flame Retardancy of Polymeric Materials**", Business Communication Corporation, Stamford, Connecticut, pp280-292, 2006.

18. Hui Yang and Charles Q. Yang, "New Non-formaldehyde Flame Retardant Finishing of cotton/Nomex Blend Fabric Using A Hydroxyl-Functional Organophosphorus Oligomer," in „Flame Retardants" section of **"Proceedings of 2006 International Nonwovens Technical Conference**" (CD), International Nonwovens Technical Association**,** 2006.

19. Charles Q. Yang, "Oligomeric Maleic Acid as A New Nonformaldehyde Durable Press Finishing Agent for Cotton", in "**Book of Proceedings, 3nd International Textile, Clothing & Design Conference**", Ed. Z. Dragcevic, Faculty of Textile Technology, University of Zagreb, Croatia, pp 372-378, 2006.

20. Hui Yang and Charles Yang, "Flame Retardant Finishing of Nylon/Cotton Blend Fabric Using Hydroxyl-Functional Organophosphorus Oligomer and DMDHEU/TMM", in "**Proceedings of 2006 AATCC International Conference**", AATCC, Research Triangle Park, North Carolina, pp54-63, 2006.

21. Hui Yang and Charles Yang, "New Non-formaldehyde Flame Retardant Finishing of cotton/Nomex Blend Fabric Using A Hydroxyl-Functional Organophosphorus Oligomer", in "**Proceedings of 2006 AATCC International Conference**", AATCC, Research Triangle Park, North Carolina, pp95-104, 2006.

22. Xialing Wu and Charles Yang, "Flame Retardant Finishing of Cotton Fleece. Part II. Phosphorus-Containing Inorganic Compounds", in "**Proceedings of 2006 AATCC International Conference**", AATCC, Research Triangle Park, North Carolina, pp386-397, 2006.

23. *Charles Q. Yang and Weidong Wu, "Comparison of Reactive Organophosphorus Flame Retardant Finishes for Cotton", in "**Proceedings of 2006 AATCC International Conference**", AATCC, Research Triangle Park, North Carolina, pp407-412, 2006.

24. C. Q. Yang and Q. Qiu, "Evaluation of the Wrinkle Recovery Properties of Durable Press Finished Cotton Fabric: Wrinkle Recovery Angle versus Wrinkle Recovery Rating", "**Proceedings of the Annual International Conference and Exhibition of AATCC**", AATCC, Research Triangle Park, North Carolina, pp238-247, 2005.

25. C. Q. Yang and W. Wu and H. Yang, "New Development in Flame Retardant Finishing of Cotton and Cotton Blends", in**"Textile Processing: State of the Art & Future Development**", 2(2), 128-135, Textile Research Division, National Research Council, Cairo, Egypt, 2005.

26. C. Q. Yang and W. Wu, "Comparison of Different Reactive Organophosphorus Flame Retardant Agents for Cotton: Part I. The Bonding of the Flame Retardant Agents to Cotton", in "**Proceedings of 16th Annual BCC Conference on Flame Retardancy of Polymeric Materials**", Business Communication Corporation, Stamford, Connecticut, pp322-339, 2005.

27. W. Wu, C. Q. Yang, "Durable Flame Retardant Finishing System Based on A Hydroxy-functional Organophosphorus Oligomer and the Mixture of DMDHEU and Melamine-Formaldehyde Resin", **Polymer Preprint**, 45(1), 803-804 (2004).

28. C. Q. Yang, H. Yang and W. Wu, "Applications of A Hydroxyl-Functional

Organophosphorus Oligomer As A Durable Flame Retarding Finishing Agent for Cotton and Cotton/Polyamide Blends", in "**Proceedings of 15th Annual BCC Conference on Flame Retardancy of Polymeric Materials**", Business Communication Corporation, Stamford, Connecticut, pp239-251, 2004.

29. C. Q. Yang, H. Yang, W. Wu, "Flame Retardant Finishing of the Cotton/Nylon Batter Dress Uniform Fabric by A Hydroxy-Functional Organophosphorus Oligomer", in "**Proceedings of the Annual International Conference and Exhibition of AATCC**", AATCC, Research Triangle Park, North Carolina, pp87-99, 2004.

30. C, Q. Yang, W. Zhou, "The Abrasion Resistance of the Nonformaldehyde Durable Press Finished Cotton Fabrics: Effects of Poly(Vinyl Alcohol) As A Co-reactant and Fabric Softners", "**Book of Proceedings, 2nd International Textile, Clothing & Design Conference**", Ed. Z. Dragcevic, Faculty of Textile Technology, University of Zagreb, Croatia, pp 471-479, 2004.

31. C. Q. Yang, H. Yang, W. Wu "New Flame Retarding Finishing Systems for Cotton and Cotton/Polyamide Blends Using A Hydroxyl-Functional Organophosphorus Oligomer", "**Book of Proceedings, 2nd International Textile, Clothing & Design Conference**", Ed. Z. Dragcevic, Faculty of Textile Technology, University of Zagreb, Croatia, pp 480-489, 2004.

32. C. Q. Yang, W. Wu, J. K. Stowell, "New development in Durable Flame Retardant Finishing of Cotton", in "**Proceedings of 14th Annual BCC Conference on Flame Retardancy of Polymeric Materials**", Business Communication Corporation, Stamford, Connecticut, 2003, pp276-290,

33. W. Wu, C. Q. Yang, "Comparison of DMDHEU and Melamine-Formaldehyde as the Binders for A Hydroxyl Organophosphorus Flame Retarding Agent on Cotton", in "**Proceedings of the Annual International Conference and Exhibition of AATCC**", AATCC, Research Triangle Park, North Carolina, 2003, pp322-337.

34. C. Q. Yang, W. Wu, C. Q. Yang, "New Non- and Low-Formaldehyde Flame Retardant Finish for Cotton Based on A Hydroxy-Functional Organophosphorus Oligomer", in "**Proceedings of the Annual International Conference and Exhibition of AATCC**", AATCC, Research Triangle Park, North Carolina, 2003, pp314-321.

35. J. K. Stowell and C. Q. Yang, "A Durable Low Formaldehyde Flame Retardant Finish for Cotton Fabrics", in "**Proceedings of the Annual International Conference and Exhibition of AATCC**", AATCC, Research Triangle Park, North Carolina, 2002, pp40-47.

36. C. Q. Yang, "New Development in Nonformaldehyde Durable Press Finishing of Cotton Fabrics", in "**Proceedings of the Annual International Conference and Exhibition of AATCC**", AATCC, Research Triangle Park, North Carolina, 2002, pp222-227.

37. W. Wu, C. Q. Yang, “Correlation between Limited Oxygen Index and Phosphorus/Nitrogen Content of the Cotton Fabric Treated with An Hydroxyl-Functional Flame Retardant Agent and DMDHEU”, “**Proceedings of the Annual International Conference and Exhibition of AATCC**”, AATCC, Research Triangle Park, North Carolina, 2002, pp294-300.

38. C. Q. Yang, “New Nonformaldehyde Durable Press Finishing Agents for Cotton”, in “**Book of Proceedings of the International Textile, Clothing and Design Conference**”, Faculty of Textile Technology, University of Zagreb, Zagreb, Croatia, 2002, pp333-337.

39. C. Q. Yang, G. C. Lickfield, “Mechanical Strength Loss and Cellulose Degradation of Durable Press Finished Cotton Fabrics”, in “**Proceedings of the Annual International Conference and Exhibition of AATCC**", AATCC, Research Triangle Park, North Carolina, 2000.

40. C. Q. Yang, “FT-IR and FT-Raman Spectroscopy Study of Catalysis of Sodium Hypophosphite for the Ester Crosslinking of Cellulose,” **Polymeric Materials Science and Engineering,** 80, 345-346 (1999).

41. G. G. Xu, C. Q. Yang, “Comparison of High and Low Molecular Weight Polymeric Carboxylic Acids As Crosslinking Agents for Paper”, **Polymeric Materials Science and Engineering,** 80, 343-344 (1999).

42. C. Q. Yang, W. Wei, “Nonformaldehyde Wrinkling-Free Garment Finishing of Cotton Slacks”, "**Book of Papers, 1997 AATCC International Conference**", AATCC, Research Triangle Park, North Carolina, 515-520 (1997).

43. C. Q. Yang, K. Y. Chang, "Polymers of Maleic Acid as Nonformaldehyde Wrinkle-Free Finishing Agents", "**Book of Papers, 1996 AATCC International Conference**", AATCC, Research Triangle Park, North Carolina, 160-164 (1996).

44. C. Q. Yang, G. Bakshi, "Quantitative Analysis of the nonformaldehyde Durable Press Finishes on Cotton Fabrics Using Infrared Spectroscopy", "**Book of Papers, 1995 AATCC International Conference**", AATCC, Research Triangle Park, North Carolina, 359-370 (1995).

45. C. Q. Yang, "Thermal and Photo Oxidation of Nonwoven Polyolefin Fabrics Studied by Infrared Spectroscopy", in "**Book of Paper, INDA Environment and Waste Management Conference for Nonwoven Industry**", Association of the Nonwoven Industry, Cary, North Carolina, 85-96 (1993).

46. C. Q. Yang, "The Ester Crosslinking Mechanism of Cellulose: An Infrared Spectroscopy Study," in "**Proceedings of 34th International Union of Pure and Applied Chemists**

Congress", International Union of Pure and Applied Chemists, Beijing, China, 532(1993).

47. C. Q. Yang, "The Effect of pH on the Ester Crosslinking of Cellulose Studied by Infrared Spectroscopy," in "**Proceedings of 34th International Union of Pure and Applied Chemists Congress**", International Union of Pure and Applied Chemists, Beijing, China, 533(1993).

48. G.Bakshi, C. Q. Yang, "Quantitative Determination of Polycarboxylic Acids on Cotton Fabrics Using Infrared spectroscopy Techniques", "**Book of Papers, 1993 AATCC International Conference**", AATCC, Research Triangle Park, North Carolina, 52-60(1993).

49. C. Q. Yang, J. R. Simms, "Characterization of Petroleum Pitch Precursor Carbon Fibers Using Fourier Transform Infrared Photoacoustic Spectroscopy," **American Chemical Society Fuel Chemistry Division Preprint**, 37, 1251-1257(1992).

50. C. Q. Yang, "Mechanism of Ester Crosslinking of Cotton Cellulose Studied by Fourier Transform Infrared Spectroscopy," **Polymeric Materials Science and Engineering**, 67, 484-486(1992).

51. Charles Q. Yang, "The Effect of pH on the Nonformaldehyde Durable Press Finishing of Cotton Fabrics Studied by FT-IR Spectroscopy," in "**Book of Papers, 1992 AATCC International Conference**", AATCC, Research Triangle Park, North Carolina, 343-351(1992).

52. C. Q. Yang, J. M. Freeman, "Studies of Thermal Oxidation and Degradation of Cotton Cellulose Using FT-IR Photoacoustic Spectroscopy," **Polymeric Materials Science and Engineering**, 64, 33-35 (1991).

53. C. Q. Yang, "The Mechanism of Esterification between Polycarboxylic Acids and Cotton Cellulose Studied by FT-IR Spectroscopy," **Polymeric Materials Science and Engineering**, 64, 372-374 (1991).

54. C. Q. Yang; L. Martin, "Thermal and Photo Oxidation of Polypropylene Fibers Studied by FT-IR Photoacoustic Spectroscopy," "**Book of Papers, 1991 AATCC International Conference**", AATCC, Research Triangle Park, NC, 261-268 (1991).

55. C.Q. Yang, "Evaluation of Photoacoustic and Diffuse Reflectance Infrared Spectroscopy for the Near-Surface Analysis of Polymeric Fibers and Films", **Polymeric Materials Science and Engineering, 62, 902-910 (1990).**

56. C. Q. Yang, T. A. Perenich, W. G. Fateley, "Near-surface Analysis of Textile Fabrics, Yarns and Fibers by FT-IR Photoacoustic Spectroscopy", "**Book of Papers, 1989 AATCC International Conference",** AATCC, Research Triangle Park, N.C., 235-244

(1989)

57. C. Q. Yang, T. W. Rush, S. P. Clough, W. G. Fateley, "Studies of the Bonding and Hydrolysis of Coupling Agents on Aluminum Surfaces by Auger Electron Spectroscopy," **Polymeric Materials Science and Engineering**, 56, 304-311, (1987).

58. C. Q. Yang, J. F. Moulder, W. G. Fateley, "The Useful Combination of Fourier Transform Infrared Photoacoustic Spectroscopy and X-ray Photoelectron Spectroscopy for Fiber Surface Analysis," **Polymer Preprint**, 28, 3-5, (1987).

59. C. Q. Yang, "The AES Studies of the Interfacial Cross-Linking of the Chromium (III) Fumarato Coupling Agent in the Formation of the Aluminum- Polyethylene Composite Film," in "**Preprint of the 41st Annual Conference, Reinforced Plastics/Composite Institute,**" The Society of the Plastics Industry, New York, 2-A (1986).

60. C. Q. Yang, W. G. Fateley, "FT-IR/PAS Surface Characterization of Polymers," **Polymeric Materials Science and Engineering**, 54, 404-410 (1986).

61. C. Q. Yang, "The Interfacial Penetration of the Chromium (III) Fumarato Coupling Agent into the Aluminum Surface Layer During the Formation of Aluminum-Polyethylene Composite Film," **Polymeric Materials Science and Engineering**, 53, 579-586 (1985).

62. C. Q. Yang, T. J. Ellis, R. R. Bresee, W. G. Fateley, "Depth Profiling of FT-IR Photoacoustic Spectroscopy and Its Applications for Polymeric Material Studies," **Polymeric Materials Science and Engineering**, 53, 169-175 (1985).

63. C. Q. Yang, W. G. Fateley, J. A. Graham, "Analytical Uses of PAS," in "**1985 International Conference on Fourier and Computerized Infrared Spectroscopy**," Ed. J.G. Grasselli and D.G. Cameron, **Proc. SPIE**, 553, 303-304 (1985).

Presentations at Professional Conferences

(Presenter underlined)

1. C. Q. Yang,* X. Cheng, "Flame Retardant Finishing of Cotton Fleece Fabric: The Combination of a Hydroxyl-Functional Organophosphorus Oligomer and 1,2,3,4-Butanetetracarboxylic Acid ", Fiber Society 2009 Fall International Conference, Athens, Georgia, October 27-30, 2009.

2. Q. He and C. Q. Yang*, "Textile Flammability Measured and Evaluated by Micro-scale Combustion Calorimetry", Fiber Society 2009 Fall International Conference, Athens, Georgia, October 27-30, 2009.

3. M. Zhang, B. Qu, A. Guan, C. Q. Yang*, "Synthesis and Characterization of Flame Retardant Polymer/layered Double Hydroxide Nanocomposites via Melt Intercalation", Fiber Society 2009 Fall International Conference, Athens, Georgia, October 27-30, 2009.

4. C. Q. Yang and Q. He, "Investigation of the Flammability of Different Textile Fibers Using Microscale Combustion Calorimetry", 9th Autex (Association of the Universities if Textiles) Conference, Izimir, Turkey, May 26-28, 2009.

5. C. Q. Yang and X. Wu, "Flame Retardant Finishing of Cotton Fleece Using Non-traditional Flame Retardants", 19th Annual BCC Conference on Flame Retardancy of Polymeric Materials, Stamford, Connecticut, May 31-June 3, 2009.

6. C. Q. Yang and X. Wu, "Flame Retardant Finishing of Cotton Fleece by Multi-Functional Carboxylic Acids: Performance of Different Acids", 2009 AATCC International Conference, Myrtle Beach, South Carolina, March 10-12, 2009.

7. C. Q. Yang, D. Yang, Edward Weil, "Flame Retardant Textiles in China", 2009 AATCC International Conference, Myrtle Beach, South Carolina, March 10-12, 2009.

8. X. Cheng and C. Q. Yang, "Flame Retardant Finishing of Cotton Fleece Using Phosphorus-containing polycarboxylic Acids", 2009 AATCC International Conference, Myrtle Beach, South Carolina, March 10-12, 2009.

9. C. Q. Yang, "New Development in Functional Finishing of Cotton Textiles", 4th International Textile, Clothing & Design Conference, Dubrovnik, Croatia, October 5-8, 2008.

10. C. Q. Yang and H. Yang, "Flame Retardant Finishing of Nylon/Cotton, Blend Fabrics for Military Uniforms," 4th International Textile, Clothing & Design Conference, Dubrovnik, Croatia, October 5-8, 2008.

11. C. Q. Yang and X. Wu, "Innovative Finishing Methods for Cotton Fleece Using Non-traditional Phosphorus-Containing Flame Retardants," 4th International Textile, Clothing & Design Conference, Dubrovnik, Croatia, October 5-8, 2008.

12. C. Q. Yang, D. Chen and X. Wu, "Nonformaldehyde Durable Press Finishing of Cotton Using Multifunctional Carboxylic Acids: Recent Development", 2008 Autex World Textile Conference, Biella, Italy, June 23-26, 2008.

13. C. Q. Yang, "the New Development in Flame Retardant Finishing of Nomex Cotton and Nylon/Cotton Blend Fabrics for Protective Clothing", 2008 National Symposium on High Technology Fibrous Materials and Protective Clothing, Hangzhou, China, May 28-30, 2008.

14. C. Q. Yang and H. Yang, "Flame Retardant Nylon/Cotton Blend Military Fabrics Using Hydroxy-functional Organophosphorus Oligomer", 19th Annual BCC Conference on Flame Retardancy of Polymeric Materials, Business Communication Corporation, Stamford, Connecticut, June 8-11, 2008.

15. E. D. Weil and C. Q. Yang, "Textile Flame Retardancy – State of the Are and Recent Progresses", 19th Annual BCC Conference on Flame Retardancy of Polymeric Materials, Business Communication Corporation, Stamford, Connecticut, June 8-11, 2008.

16. C. Q. Yang and H. Yang, "The Bonding of a Hydroxyl-Functional Organophosphorus Oligomer onto nylon and Flame Retardant Finishing of Nylon/Cotton Blend Fabric", 2007 AATCC International Conference, Charleston, South Carolina, October 2-4, 2007.

17. Xialing Wu and Charles Q. Yang, "Flame Retardant Finishing of Cotton Fleece Fabric Using Maleic Acid/NaH2PO2", 2007 AATCC International Conference, Charleston, South Carolina, October 2-4, 2007.

18. C. Q. Yang and H. Yang "Flame Retardant Polyamide/Cotton Blend Fabrics for Protective Clothing by Formation of Crosslinked Polymeric Network Based on A Hydroxy-functional Organophosphorus Oligomer", 5th Central European Conference on Fiber-grade polymers, Chemical Fibers and Special Textiles, Cracow, Poland, September 5-8, 2007.

19. B. Vončina, V. Vivod, D. Jaušovec, S. Hunjadi, Xialing Wu, C. Q. Yang, "Investigation of the Chemical reactions of Maleic Acid with Sodium Hypophosphite and Its Used as a Crosslinking System for Cotton", 5th Central European Conference on Fiber-grade polymers, Chemical Fibers and Special Textiles, Cracow, Poland, September 5-8, 2007.

20. C. Q. Yang and H. Yang, "New Organophosphorus Flame Retardant Finishing Systems for Cotton Blends Used for Military Protective Clothing", 7th Annual Textile Conference by Autex (Association of Universities for Textiles), Tampere, Finland, June 26-28, 2007.

21. C. Q. Yang and H.Yang, "A New Flame Retardant Finished Nomex/Cotton Blend Fabric for Protective Clothing", 18th Annual BCC Conference on Flame Retardancy of Polymeric Materials, Business Communication Corporation, Stamford, Connecticut, May 21-23, 2007.

22. C. Q. Yang and H. Yang, "The Bonding of A Hydroxyl-Functional Organophosphorus Flame Retarding Agent to Nylon Fabric and the Flame Retardant Finishing of Cotton/Nylon Military Fabric", 2007 Spring ACS National Meeting, Division of Cellulose, Paper and Textile, Chicago, March 25-29, 2007.

23. C. Q. Yang and X. Wu, "Applications of Non-traditional Flame Retardant Finishing Agents to Reduce the Flammability of Cotton Fleece", 2007 Spring ACS National Meeting, Division of Cellulose, Paper and Textile, Chicago, March 25-29, 2007.

24. C. Q. Yang and D. Chen, "New Nonformaldehyde Durable Press Finishing Agent for Cotton by the Reactions of Maleic acid and Sodium Hypophosphite on Cotton", 2007 Spring ACS National Meeting, Division of Cellulose, Paper and Textile, Chicago, March 25-29, 2007.

25. C. Q. Yang and W. Wu, "Comparison of Reactive Organophosphorus Flame Retardant Finishes for Cotton", 2006 AATCC International Conference, Atlanta, October 31- November 2, 2006.

26. H. Yang and C. Q. Yang, "Flame Retardant Finishing of Nylon/Cotton Blend Fabric Using Hydroxyl-Functional Organophosphorus Oligomer and DMDHEU/TMM", 2006 AATCC International Conference, Atlanta, October 31- November 2, 2006.

27. H. Yang and C. Q. Yang, "New Non-formaldehyde Flame Retardant Finishing of cotton/Nomex Blend Fabric Using A Hydroxyl-Functional Organophosphorus Oligomer", 2006 AATCC International Conference, Atlanta, October 31- November 2, 2006.

28. X. Wu and C. Yang, "Flame Retardant Finishing of Cotton Fleece Using Phosphorus-Containing Inorganic Compounds", 2006 AATCC International Conference, Atlanta, October 31- November 2, 2006.

29. C. Q. Yang, "Oligomeric Maleic Acid as A New Nonformaldehyde Durable Press Finishing Agent for Cotton", 3rd International Textile, Clothing & Design Conference, Dubrovnik, Croatia, October 8-11, 2006.

30. H. Yang and C. Q. Yang, "New Non-formaldehyde Flame Retardant Finishing of Cotton/Nomex Blend Fabric Using A Hydroxyl-Functional Organophosphorus Oligomer," 2006 International Nonwovens Technical Conference, Houston, Texas, September 25-28, 2006.

31. H. Yang and C. Q. Yang, "Flame Retardant Finishing of Nylon/Cotton Blend Fabric Using Hydroxyl-Functional Organophosphorus Oligomer and DMDHEU/TMM", 2006 Fall ACS National Meeting, Division of Cellulose, Paper and Textile, San Francisco, CA, September 10-14, 2006.

32. C. Q. Yang, G. G. Xu and I. J. Amster, "Mass Spectroscopy Study of Aqueous Polymerization of Maleic Acid", 2006 International Congress on Analytical Sciences, Moscow, Russia, June 25-30, 2006.

33. C. Q. Yang, "New Development in Durable Flame Retardant Finishing of Cotton Textiles", 6th Symposium on Functional Textiles and Nano Technology Application", Beijing, China, May 26-27, 2006.

34. C. Q. Yang, X. Wu and X. Qiu, "Fame Retardant Finishing of Cotton Fleece Fabrics Using Phosphorus and Nonphosphorus Chemicals," 17h Annual BCC Conference on Flame Retardancy of Polymeric Materials", Business Communication Corporation, Stamford, Connecticut, May 22-24, 2006.

35. C. Q. Yang and X. Qiu, "Flame Retardant Finishing of Cotton Fleece Fabrics Using A Hydroxy-Functional Organophosphorus Oligomer", 2006 Spring ACS National Meeting, Division of Cellulose, Paper and Textile, Atlanta, Georgia, March 26-30, 2006.

36. H. Yang and C. Q. Yang, "New Non-formaldehyde Flame Retardant Finishing System for Cotton/Nomex Blend Based on A Hydroxyl-Functional Organophosphorus Oligomer", 2006 Spring ACS National Meeting, Division of Cellulose, Paper and Textile, Atlanta, Georgia, March 26-30, 2006.

37. X. Wu and C. Q. Yang, "Inorganic Phosphorus-Based Flame Retardant Finishing of Cotton Fleece Flammability", 2006 Spring ACS National Meeting, Division of Cellulose, Paper and Textile, Atlanta, Georgia, March 26-30, 2006.

38. C. Q. Yang, "Development of Nonformaldehyde Durable Press Finishing Agents for Cotton Based on Multifunctional Carboxylic Acids to Replace the Formaldehyde-Based Reagents", Spring ACS National Meeting, Division of Cellulose, Paper and Textile, Atlanta, Georgia, March 26-30, 2006.

39. H. Yang and C. Q. Yang, "Thermal Degradation of Cotton, Nylon and Cotton/Nylon Blend Treated with A Organophosphorus Oligomer Flame Retardant Compound", Spring ACS National Meeting, Division of Cellulose, Paper and Textile, Atlanta, Georgia, March 26-30, 2006.

40. C. Q. Yang and X. Qiu, "Evaluation of the Wrinkle Recovery Properties of Durable Press Finished Cotton Fabric: Wrinkle Recovery Angle versus Wrinkle Recovery Rating", 2005 International Conference, Boston, Massachusetts, October 25-27, 2005.

41. C. Q. Yang and W. Wu, "Comparison of Different Reactive Organophosphorus Flame Retardant Agents for Cotton: Part I. The Bonding of the Flame Retardant Agents to Cotton", 16th Annual BCC Conference on Flame Retardancy of Polymeric Materials", Business Communication Corporation, Stamford, Connecticut, May 23-25, 2005.

42. C. Q. Yang and W. Wu and H. Yang, "New Development in Flame Retardant Finishing of Cotton and Cotton Blends", The 2nd International Conference of Textile Research Division, National Research Council, Cairo, Egypt, April 11-13, 2005

43. C, Q. Yang, W. Zhou, "The Abrasion Resistance of the Nonformaldehyde Durable Press Finished Cotton Fabrics: Effects of Poly(vinyl Alcohol) As A Co-reactant and Fabric Softeners", 2nd International Textile, Clothing & Design Conference, Dubrovnik, Croatia, October 3-6, 2004.

44. C, Q. Yang, H. Yang, W. Wu "New Flame Retarding Finishing Systems for Cotton and Cotton/Polyamide Blends Using A Hydroxyl-Functional Organophosphorus Oligomer", 2nd International Textile, Clothing & Design Conference, Dubrovnik, Croatia, October 3-6, 2004.

45. C. Q. Yang, H. Yang, W. Wu, "Flame Retardant Finishing of the Cotton/Nylon Batter Dress Uniform Fabric by A Hydroxy-Functional Organophosphorus Oligomer", 2004 AATCC International Conference, Greenville, South Carolina, September 13-17, 2004.

46. C. Q. Yang, H. Yang, W. Wu, "Applications of A Hydroxyl-Functional Organophosphorus Oligomer As A Durable Flame Retarding Finishing Agent for Cotton and Cotton/Polyamide Blends", 15th Annual BCC Conference on Flame Retardancy of Polymeric Materials, Stamford, Connecticut, June 6-9, 2004.

47. W. Wu, C. Q. Yang, "Durable Flame Retardant Finishing System Based on A Hydroxy-functional Organophosphorus Oligomer and the Mixture of DMDHEU and Melamine-Formaldehyde Resin", 2004 Spring ACS Spring National Meting, Division of Polymer Chemistry, Anaheim, California, April 1-5, 2004.

48. C. Q. Yang, W. Wu, "New Non- and Low-Formaldehyde Flame Retardant Finish for Cotton Based on A Hydroxy-Functional Organophosphorus Oligomer", 2003 AATCC International Conference, Greenville, South Carolina, September 9-12, 2003.

49. W. Wu, C. Q. Yang, "Comparison of DMDHEU and Melamine-Formaldehyde As the Binding Agents for A Hydroxy-Functional Organophosphorus Flame Retarding Agent on Cotton", 2003 AATCC International Conference, Greenville, South Carolina, September 9-12, 2003.

50. C. Q. Yang, W. Wu, J. K. Stowell, J. K., "New development in Durable Flame Retardant Finishing of Cotton", 14th Annual BCC Conference on Flame Retardancy of Polymeric Materials, Stamford, Connecticut, June 2-4, 2003.

51. C. Yang, "Application of FT-IR and FT-Raman Spectroscopy to the Studies of Crosslinking of Cotton cellulose by Multifunctional carboxylic Acids, 15th European Symposium on Polymer Spectroscopy, Heraklion, Greece, June 8-12, 2003.

52. C. Q. Yang, G. C. Lickfield and "Mechanical Strength and Abrasion Resistance in Durable Press Cotton Fabrics: Use of Hydroxy-Functional Polymers to Improve Abrasion Resistance", the 10th National Textile Center Forum, Hilton Head Island, South Carolina, February 16-18, 2003.

53. C. Q. Yang, "New Nonformaldehyde Durable Press Finishing Agents for Cotton", 1st International Textile, Clothing and Design Conference", Dubrovnik, Croatia, October 6-9, 2002.

54. J. K. Stowell, C. Q. Yang, "A Durable Low Formaldehyde Flame Retardant Finish for Cotton Fabrics", 2002 AATCC International Conference, Charlotte, October 2-4, 2002.

55. C. Q. Yang, "New Development in Nonformaldehyde Durable Press Finishing of Cotton Fabrics", 2002 AATCC International Conference, Charlotte, October 2-4, 2002.

56. W. Wu, C. Q. Yang, "Correlation between Limited Oxygen Index and Phosphorus/Nitrogen Content of the Cotton Fabric Treated with An Hydroxyl-Functional Flame Retardant Agent and DMDHEU", 2002 AATCC International Conference, Charlotte, October 2-4, 2002.

57. C. Q. Yang, W. Wu, "New Durable Flame Retardant Finishing Systems Based on Hydroxyl-functional Organophosphorus Oligomers", 2nd International Conference on Polymer Modification, Degradation and Stabilization, Budapest, Hungary, 30 June – 4 July, 2002.

58. W. Wu, X. Zhen, C. Q. Yang, "Correlation between Limited Oxygen Index and Phosphorus Content of the Cotton Fabric Treated with An Organophosphorus Flame Retardant Finishing System", 2002 Spring ACS National Meeting, Division of Cellulose, Paper and Textile, Orlando, Florida, April 7-11, 2002.

59. C. Q. Yang, G. G. Xu, "Applications of Glyoxal and Glutaraldehyde as Paper Wet Strength Agents: A Comparative Study", 2002 Spring ACS National Meeting, Division of Cellulose, Paper and Textile, Orlando, Florida, April 7-11, 2002.

60. C. Q. Yang, G. Lickfield, "Mechanical Strength and Abrasion Resistance in Durable Press Cotton Fabrics: Distribution of the Crosslinking Agents", the 10th National Textile Center Forum, Greenville, South Carolina, February 10-12, 2002.

61. G. G. Xu, C. Q. Yang, I. J. Amster, "Mass Spectrometry of Low Molecular Weight Polycarboxylic Acids and Mechanism of Aqueous Polymerization of Maleic Acids", 49th

Annual Conference on Mass Spectrometry and Allied Topics, Chicago, Illinois, May 26-31, 2001.

62. C. Q. Yang, "Free Radical Polymerization of Maleic Acid and Fumaric Acid and Applications of Polymeric Acids as Crosslinking Agents for Cellulose", 3rd IUPAC International Symposium on Free Radical Polymerization: Kinetics and Mechanism, Luca, Italy, 3-9 June, 2001

63. C. Q. Yang, D. Zhang, "Polymerization of Maleic Acid and Applications of Poly(maleic acid) as A Crosslinking Agent for Cotton", 2001 Spring ACS National Meeting, Division of Polymeric Materials Science and Engineering, San Diego, California, April 1-5, 2001.

64. C. Q. Yang, G. Lickfield, "Mechanical Strength and Abrasion Resistance in Durable Press Cotton Fabrics: Mechanism of Fabric Abrasion Resistance Decrease", the 9th National Textile Center Forum, , Mytel Beach, South Carolina, January 28-30, 2001.

65. G. G. Xu, C. Q. Yang, "Dialdehyde As Crosslinking Agents for Improving Paper Wet Strength", 2001 Spring ACS National Meeting, Division of Polymeric Materials Science and Engineering, San Diego, California, April 1-5, 2001.

66. C. Q. Yang, "Application of Polymeric Carboxylic Acids as Environmental-Friendly Crosslinking Agents for Cotton and Paper", the 2000 International Chemical Congress of Pacific Basin Societies, Honolulu, Hawaii, December 14-19, 2000.

67. C. Q. Yang, X. Gu, D. Zhang, "New Synthesis Method for the Polymerization of Maleic Acid, Fumaric acid and Itaconic Acid with a Novel Redox Free Radical Initiation System", the 2000 International Chemical Congress of Pacific Basin Societies, Honolulu, Hawaii, December 14-19, 2000.

68. C. Q. Yang, G. C. Lickfield, "Mechanical Strength Loss and Cellulose Degradation of Durable Press Finished Cotton Fabrics", 2000 AATCC International Conference, September 17-20, 2000.

69. C. Q. Yang, "Environmental Friendly Functional Polymers for Cellulose Modification", 2000 IUPAC Macromolecular Symposium, Warsaw, Poland, July 9-14, 2000.

70. C. Q. Yang, X. Gu, D. Zhang, "Polymerization of Maleic Acid and Itaconic Acid with a Novel Redox Free Radical Initiation System", 2000 IUPAC Macromolecular Symposium, Warsaw, Poland, July 9-14, 2000.

71. C. Q. Yang, G. G. Xu, "Polymeric Carboxylic Acids for Modification of Cellulose Materials: An Environment-Friendly Alternatives", 9th IUPAC International Conference on Polymer Based Technology, Tianjin, China, May 21-26, 2000.

72. C. Q. Yang, G. C Lickfield, "Investigation of Flexible Crosslinking Systems for the Retention of Mechanical Strength and Abrasion Resistance in Durable Press Cotton Fabrics: the Change in Molecular Weight of Cellulose", the 8th National Textile Center Forum, , Mytel Beach, South Carolina, January 28-30, 2000.

73. C. Q. Yang, G. C. Lickfield, "Mechanical Strength and Cellulose Molecular Weight of Durable Press Finished Cotton Fabric", the Fiber Society 1999 Fall Technical Conference, October 20-22, 1999, Clemson, South Carolina.

74. C. Q. Yang, "Application of FT-IR Spectroscopy to Characterize Crosslinking of Cotton: the Development of A New Nonformaldehyde Durable Press Finish", 33rd International Spectroscopy Symposium, Ankara, Turkey, September 5-10, 1999.

75. C. Q. Yang, "FT-IR Spectroscopy Study of Ester Crosslinking of Cellulose", 1999 Spring ACS National Meeting, Division of Cellulose, Paper, and Textile, Anaheim, California, March 21-25, 1999.

76. C. Q. Yang, G. G. Xu, Y. Xu, "The Intra- and Inter-Fiber Crosslinking of Cellulose and Its Effects on the Properties of Paper", 1999 Spring ACS National Meeting, Division of Cellulose, Paper, and Textile, Anaheim, California, March 21-25, 1999.

77. C. Q. Yang, X. Gu, "FT-IR and FT-Raman Spectroscopy Study of Catalysis of Sodium Hypophosphite for the Ester Crosslinking of Cellulose", 1999 Spring ACS National Meeting, Division of Polymeric Materials Science and Engineering, Anaheim, California, March 21-25, 1999.

78. C. Q. Yang, X. Gu, "Comparison of High and Low Molecular Weight Polymeric Carboxylic Acids As Crosslinking Agents for Paper", 1999 Spring ACS National Meeting, Division of Polymeric Materials Science and Engineering, Anaheim, California, March 21-25, 1999.

79. C. Q. Yang, G. Lickfield, "Investigation of Flexible Crosslinking Systems for the Retention of Mechanical Strength and Abrasion Resistance in Durable Press Cotton Fabrics: the Effects of Acid Degradation and Catalysts", the 7th National Textile Center Forum, Mytel Beach, South Carolina, January 27-29, 1999.

80. C. Q. Yang, W. Wei, "Cotton Cellulose Degradation Studied by A Multiple-Angle Laser Light-Scattering Photometer", the 9th Light Scattering User's Forum, Santa Barbara, California, October 26-28, 1998.

81. C. Q. Yang, "The Intra- and Inter-Fiber Crosslinking of Cellulose and Its Effects on the Properties of Cellulosic Materials", 1998 IUPAC Macromolecule Symposium, Gold Coast, Queensland, Australia, July 12-17, 1998.

82. C. Q. Yang, Y. Xu, "New Crosslinking Agents for Environmental Friendly Wet Strength Paper", 1998 IUPAC Macromolecule Symposium, Gold Coast, Queensland, Australia, July 12-17, 1998.

83. C. Q. Yang, "Crosslinking of Cellulosic Materials: New Development and Industrial Applications", Symposium on Chemistry into 21st Century, Beijing, China, May 2-5, 1998.

84. C. Q. Yang, G. Lickfield, "Investigation of Flexible Crosslinking Systems for the Retention of Mechanical Strength and Abrasion Resistance in Durable Press Cotton Fabrics: the Effects of Acid Degradation and Crosslinking of Cellulose", the 6th National Textile Center Forum, Panama City, Florida, January 28-30, 1998.

85. C. Q. Yang, "The Ester Crosslinking of Cellulose and the Properties of Cotton Textiles and Paper", 5th Chemical Congress of North America, Cancun, Mexico, November 11-15, 1997.

86. C. Q. Yang, "Polymeric Carboxylic Acids as Nonformaldehyde Durable Press Finishes for Cotton Fabrics", 1997 Fall Fiber Society General Technical Conference, Knoxville, Tennessee, October 20-22, 1997.

87. W. Wei, C. Q. Yang, "Nonformaldehyde Wrinkling-Free Garment Finishing Using Polymeric Carboxylic Acid-Based Crosslinking Agents", 1997 Fall Fiber Society General Technical Conference, Knoxville, Tennessee, October 20-22, 1997.

88. W. Wei, C. Q. Yang, "Nonformaldehyde Wrinkling-Free Garment Finishing of Cotton Slacks", 1997 AATCC International Conference, Atlanta, Georgia, September 28-October 1, 1997.

89. C. Q. Yang, "Analytical Applications of FT-IR Spectroscopy to the Study of Crosslinking Reactions of Cotton Cellulose", 36th IUPAC Congress, Geneva, Switzerland, August 17-22, 1997.

90. C. Q. Yang, "Ester Crosslinking of Cellulose and the Performance of the Crosslinked Cellulosic Material", 36th IUPAC Congress, Geneva, Switzerland, August 17-22, 1997.

91. C. Q. Yang, X. Wang, "Applications of FT-IR Spectroscopy to the Studies of Esterification and Crosslinking of Cellulose by Polycarboxylic Acids: Part I. Formation of Cyclic Anhydrides as the Reactive Intermediates", 11th International Conference on Fourier Transform Spectroscopy, Athens, Georgia, August 10-15, 1997.

92. C. Q. Yang, X. Wang, "Applications of FT-IR Spectroscopy to the Studies of Esterification and Crosslinking of Cellulose by Polycarboxylic Acids: Part II. The Performance of the Crosslinked Cotton Fabrics", 11th International Conference on Fourier Transform Spectroscopy, Athens, Georgia, August 10-15, 1997.

93. S. A. Bhat, C. Q. Yang, J. A. De Haseth, “Study of ester Crosslinking Reactions on Aluminum Surfaces by Infrared Attenuated Total Reflectance Spectroscopy”, 11th International Conference on Fourier Transform Spectroscopy, Athens, Georgia, August 10-15, 1997.

94. C. Q. Yang, “The Intra-Fiber Crosslinking of Cellulose and Its Effects on the Properties of Cellulosic Materials", Fiber Society International Conference on Advances in Fiber and Textile Science, Mulhouse, France, April 21-24, 1997.

95. C. Q. Yang, "The Formation of Cyclic Anhydride Intermediates by Polycarboxylic Acids Studied Using Thermal Analysis and Infrared Spectroscopy", 1997 Pittsburgh Conference, Atlanta, Georgia, March 16-21, 1997.

96. C. Q. Yang, Y. Xu, D. Wang, "FT-IR Spectroscopy Study of Paper Wet Strength improvement and Esterification of Wood Pulp Cellulose by Polycarboxylic Acids", 1997 Pittsburgh Conference, Atlanta, Georgia, March 16-21, 1997.

97. C. Q. Yang, D. Wang, "Infrared Spectroscopy Quantitative Determination of Ester and Free Carboxyl on the Cotton Fabric Crosslinked by A Polycarboxylic Acid", 1997 Pittsburgh Conference, Atlanta, Georgia, March 16-21, 1997.

98. W. Wei, C. Q. Yang, "Predicting the Wrinkle-Resistance of the Durable Press Finished Cotton Fabric Using Infrared Spectroscopy", 1997 Pittsburgh Conference, Atlanta, Georgia, March 16-21, 1997.

99. C. Q. Yang, K. Y. Chang, "Polymers of Maleic Acid as Nonformaldehyde Wrinkle-Free Finishing Agents", 1996 AATCC International Conference, Nashville, Tennessee, October 15-18, 1996.

100. Yufeng Xu, C. M. Chen, C. Q. Yang, "Polycarboxylic Acids and paper Wet Performance", 1996 Fall ACS National Meeting, Division of Cellulose, Textile and Paper, Orlando, August 25-29, 1996.

101. C. Q. Yang, Y. Xu, "Nonformaldehyde Wet Strength Resins for Paper: Polycarboxylic Acids as Crosslinking Agents for Wood Pulp Cellulose", 36th IUPAC International Symposium on Macromolecules, Seoul, Korea, August 4-9 1996.

102. C. Q. Yang, "Comparison of the Formation of Cyclic Anhydride Intermediates and Esterification of Cotton Cellulose by Polycarboxylic Acids: An Infrared Spectroscopy Study", 1996 Spring ACS National Meeting, Division of Polymeric Materials Science and Engineering, New Orleans, March 24-28, 1996.

103. C. Q. Yang, "Infrared Spectroscopy Study of the Ester Crosslinking of Cellulose by Polycarboxylic Acids: the Molecular Weight and the Reactivity of a Crosslinking

Agent", 1996 Spring ACS National Meeting, Division of Cellulose, Textile and Paper, New Orleans, March 24-28, 1996.

104. C. Q. Yang, "The Ester Crosslinking of Cellulose by A Polycarboxylic Acid: the Molecular Structure, the Size, and the Reactivity of A Crosslinking Agent", Third International Chemical Congresses of Pacific Basin Societies, Honolulu, Hawaii, December 17-22, 1995.

105. D. E. Himmesbach, F. E. Barton, C. Q. Yang and J. Kelly, "Use of Diffuse Reflectance NIR and MIR with PLS-1 for Quantitation of Textile Finishes on Polypropylene Film", 1995 Eastern Analytical Symposium, Somerset, New Jersey, November 12-17, 1995.

106. C. Q. Yang, G. Bakshi, "Quantitative Analysis of the nonformaldehyde Durable Press Finishes on Cotton Fabrics Using Infrared Spectroscopy", 1995 AATCC International Conference, Atlanta, Georgia, October 8-11, 1995.

107. C. Q. Yang, "Nonformaldehyde Crosslinking of Cotton Cellulose by Polycarboxylic Acids: the Chemical Reaction Mechanism, the Catalysts and the Durable Press Performance of the Crosslinked Cotton Fabric", Third Asian Textile Conference: Textile Research and Development in the Pacific Rim, Hong Kong, September 19-21, 1995.

108. C. Q. Yang, "The Chemical Reactions in the Crosslinking of Cellulose", First Worldwide Conference of Young Chinese Chemists, Beijing, China, August 20-24, 1995.

109. C. Q. Yang, G. D. Bakshi, "The Acid-Base Equilibrium and the FT-IR Spectroscopy Quantitative Analysis of Ester Crosslinking in Cotton Cellulose", 1995 Pittsburgh Conference (1268), New Orleans, Louisiana, March 6-10, 1995.

110. C. Q. Yang, "Infrared Spectroscopy Studies of Ester Crosslinking of Cotton Cellulose by Polycarboxylic Acids: the Effects of the Molecular Structure of the Crosslinking Agents", 1995 Pittsburgh Conference (1269), New Orleans, Louisiana, March 6-10, 1995.

111. C. Q. Yang, "Characterization of Ester Crosslinking in Cellulose Using FT-IR Spectroscopy", Third International Conference on Polymer Characterization, Denton, Texas, January 11-13, 1995.

112. C. Q. Yang, "Identification of Chemical Contamination on Textile Yarns Using Extraction and Infrared Spectral Subtraction," 1994 Textile Institute International Conference, Atlanta, Georgia, September 25-28, 1994.

113. C. Q. Yang and Gagan D. Bakshi, "Quantitative Analysis of Ester Crosslinking in Cotton Fabrics Using Infrared Spectroscopy," 1994 Fall ACS National Meeting, Division of Cellulose, Textile and Paper (27), Washington, D.C, August 21-26, 1994.

114. C. Q. Yang, "Ester Crosslinking of Cellulose: the Mechanism and the Effects of the Catalysts," 1994 Fall ACS National Meeting, Division of Cellulose, Textile and Paper, Washington, D.C., August 21-26, 1994.

115. G. D. Bakshi and Charles Q. Yang, "Quantitative Determination of Polycarboxylic Acids on Cotton Fabrics Using Infrared spectroscopy Techniques", 1993 AATCC International Conference, Montreal, Quebec, Canada, October 3-6, 1993.

116. C. Q. Yang, "The Ester Crosslinking Mechanism of Cellulose: An Infrared Spectroscopy Study," 34th IUPAC Congress, Beijing, China, August 15-20, 1993.

117. C. Q. Yang, "The Effect of pH on the Ester Crosslinking of Cellulose Studied by Infrared Spectroscopy," 34th IUPAC Congress, Beijing, China, August 15-20, 1993.

118. C. Q. Yang, "Thermal and Photo Oxidation of Nonwoven Polyolefin fabrics Studied by Infrared Spectroscopy," Environmental Management Conference for the Nonwoven Industry, Arlington, Virginia, June 15-17, 1993.

119. C. Q. Yang, "Infrared Spectroscopy Analysis of the Ester Crosslinking of Cotton Cellulose," 1993 Pittsburgh Conference (467), Atlanta, Georgia, March 1993.

120. C. Q. Yang, "The Effect of pH on the Nonformaldehyde Durable Press Finishing of Cotton Fabrics Studied by FT-IR Spectroscopy," 1992 AATCC International Conference, Atlanta, Georgia, October 1992.

121. C. Q. Yang, J. R. Simms, "Characterization of Petroleum Pitch Precursor Carbon Fibers Using Fourier Transform Infrared Photoacoustic Spectroscopy," 1992 Fall ACS National Meeting, Division of Fuel Chemistry, Washington, DC, August 1992.

122. C. Q. Yang, "Mechanism of Ester Crosslinking of Cotton Cellulose Studied by Fourier Transform Infrared Spectroscopy," 1992 Fall ACS National Meeting, Division of Polymeric Materials Science and Engineering, Washington, D.C., August 1992.

123. C. Q. Yang J. R. Simms, "Studies of the Stabilization Process of Pitch Carbon Fibers Using FT-IR Photoacoustic Spectroscopy", 1992 Pittsburgh Conference (1224), New Orleans, Louisiana, March 1992.

124. L. Martin and C. Q. Yang, "Degradation of Disposable Nonwoven Polyethylene Textiles Studied by FT-IR Photoacoustic Spectroscopy", 1992 Pittsburgh Conference (1225), New Orleans, Louisiana, March 1992.

125. C. Q. Yang and Linette Martin, "Thermal and Photo Oxidation of Polypropylene Fibers Studied by FT-IR Photoacoustic Spectroscopy", 1991 AATCC International Conference, Charlotte, North Carolina, October 1991.

126. C. Q. Yang and James M. Freeman, "Studies of Thermal Oxidation and Degradation of Cotton Fabrics Using FT-IR Photoacoustic Spectroscopy", 1991 Spring ACS National Meeting, Division of Polymeric Materials Science and Engineering, Atlanta, Georgia, April 1991.

127. C. Q. Yang, "The Mechanism of Esterification Between Polycarboxylic Acids and Cotton Cellulose Studied by FT-IR Spectroscopy", 1991 Spring ACS National Meeting, Division of Polymeric Materials Science and Engineering, Atlanta, Georgia, April 1991.

128. Charles Q. Yang, "Infrared Spectroscopic Analysis of Textile Fabrics and Fibers Using Photoacoustic Detection", 1991 Spring ACS. National Meeting, Division of Cellulose, Textile and Paper, Atlanta, Georgia, April 1991.

129. C. Q. Yang, B.A. Andrews and C. M. Welch, "Infrared Spectroscopic Studies of the Nonformaldehyde Finishing of Cotton Fabrics by Polycarboxylic Acids", 1990 Spring ACS National Meeting, Division of Cellulose, Textile and paper, Boston, Massachusetts, April 1990.

130. C. Q. Yang, "Evaluation of Photoacoustic and Diffuse Reflectance Infrared Spectroscopy for the Near-Surface Analysis of Polymeric Fibers and Films", 1990 Spring ACS National Meeting, Macromolecular Secretariat, Boston, Massachusetts, April 1990.

131. C. Q. Yang, "Studies of the Cross-Linking of Cotton Cellulose by FT-IR Photoacoustic Spectroscopy," 1990 Pittsburgh Conference, New York City, New York, March 1990.

132. C. Q. Yang, J. M. Freeman, "Studies of the Oxidation of Cotton Fabrics by FT-IR Photoacoustic Spectroscopy," 1990 Pittsburgh Conference, New York City, New York, March 1990.

133. C. Q. Yang, T. A. Perenich, "Near-Surface Analysis of Textile Fabrics, Yarns and Fibers by FT-IR Photoacoustic Spectroscopy", 1989 AATCC International Conference, Philadelphia, PA, October 1989.

134. C. Q. Yang, "Characterization of the Ester Cross-Linkages Between Cotton Cellulose and Polycarboxylic Acid in Cotton Fabrics Using FT-IR Photoacoustic Spectroscopy", International Conference on Analytical Chemistry Organized by the Royal Society of Chemistry, Cambridge, U.K, July 1989.

135. C. Q. Yang, "Applications of FT-IR Photoacoustic Spectroscopy to the Near- Surface Analysis of Polymeric Materials", International Conference on Analytical Chemistry Organized by the Royal Society of Chemistry, Cambridge, U.K., July 1989.

136. C. Q. Yang, "Applications of FT-IR Photoacoustic Spectroscopy to the Near- Surface Characterization of Chemically Modified Textiles", 1989 Pittsburgh Conference, Atlanta, Georgia, March 1989.

137. C. Q. Yang and J. M. Freeman, "Comparison of Photoacoustic, Attenuated Total Reflection and Diffuse Reflection Infrared Spectroscopy for Near-Surface Analysis", 1989 Pittsburgh Conference, Atlanta, Georgia, March 1989.

138. C. Q. Yang, "Studies of the Finish Distribution in the Chemically Modified Fabrics by FT-IR Photoacoustic Spectroscopy", 20th ACS Central Regional Meeting, Morgantown, West Virginia, June 1988.

139. C. Q. Yang, "Studies of the Electron Beam Damage of the Molecular Species Absorbed on Aluminum Surface during AES Date Acquisition", 20th ACS Central Regional Meeting , Morgantown, West Virginia, June 1988.

140. C. Q. Yang, W. G. Fateley, "Near Surface Characterization of Textile Materials by the Combination of FT-IR Photoacoustic Spectroscopy and A Spectral Subtraction Technique", 1988 Pittsburgh Conference (456), New Orleans, Louisiana, February 1988.

141. C. Q. Yang, T. W. Rush, S. P. Clough, W. G. Fateley, "Studies of the Bonding and Hydrolysis of Coupling Agents on Aluminum Surfaces by Auger Electron Spectroscopy", ACS National Meeting, Division of Polymeric Materials Science and Engineering, Denver, Colorado, April 1987.

142. C. Q. Yang, T. W. Rush, S. P. Clough, W. G. Fateley, "The Chemical Bonding Between Chromium (III) Fumarato Coupling Agent and Aluminum Oxide Studied by Auger Electron Spectroscopy", 1987 Pittsburgh Conference, Atlantic City, New Jersey, March 1987.

143. C. Q. Yang, J. F. Moulder, W. G. Fateley, "The Useful Combination of Fourier Transform Photoacoustic Spectroscopy and X-ray Photoelectron Spectroscopy for Fiber Surface Analysis", ACS National Meeting, Division of Polymeric Materials Science and Engineering, Denver, Colorado, April 1987.

144. C. Q. Yang, W. G. Fateley, T. A. Perenich, "FT-IR/PAS Studies of the Foam Finished Cotton Fabrics", ACS National Meeting, Division of Cellulose, Paper and Textile, Anaheim, California, September 1986.

145. C. Q. Yang, W. G. Fateley, "Near Surface Analysis of Textile Materials Using FT-IR Photoacoustic Spectroscopy", The Thirteenth Annual Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies, St. Louis, Missouri, September 1986.

146. C. Q. Yang, W. G. Fateley, "FT-IR/PAS Surface Characterization of Polymers", ACS National Meeting, Division of Polymeric Materials Science and Engineering, New York City, New York, April 1986.

147. C. Q. Yang, T. J. Ellis, R. R. Bresee, W. G. Fateley, "Studies of Chemically-Modified Polyethylene Terephthalate Fibers with SEM, ESCA and FT-IR/PAS", 1986 Pittsburgh Conference, Atlantic City, New Jersey, March 1986.

148. C. Q. Yang, W. G. Fateley, "Surface Analysis of Polymeric Materials with FT-IR/PAS", 1986 Pittsburgh Conference, Atlantic City, New Jersey, March 1986,

149. C. Q. Yang, R. R. Bresee, W. G. Fateley, "Characterization of the Sized Textile Yarns with FT-IR/PAS" 1986 Pittsburgh Conference (871), Atlantic City, New Jersey, March 1986.

150. C. Q. Yang, "AES Studies of the Interfacial Cross-Linking for the Chromium (III) Fumarato Coupling Agent in the Formation of the Aluminum- Polyethylene Composite Film", 41st Annual Conference, Reinforced Plastics/Composites Institute, The Society of the Plastics Industry (2-A), Atlanta, Georgia, January 1986.

151. C. Q. Yang, T. J. Ellis, R. R. Bresee, W. G. Fateley, T. A. Perenich, "Studies of Cellulose Fibers and Fabrics by FT-IR PAS", ACS National Meeting, Division of Cellulose, Paper and Textile (14), Chicago, Illinois, September 1985.

152. C. Q. Yang, T. J. Ellis, R. R. Bresee, W. G. Fateley, "The Depth Profiling of FT-IR Photoacoustic Spectroscopy and Its Applications in Polymeric Material Studies", ACS National Meeting, Division of Polymeric Materials Science and Engineering (36), Chicago, Illinois, September 1985.

153. C. Q. Yang, "The Interfacial Penetration of the Chromium (III) Fumarato Coupling Agent into the Aluminum Surface Layer during the Formation of Aluminum-Polyethylene Composite Film", ACS National Meeting, Division of Polymeric Materials Science and Engineering (121), Chicago, Illinois, September 1985.

154. C. Q. Yang, T. J. Ellis, R. R. Bresee, W. G. Fateley, T. A. Perenich, "Studies of Cellulose Fibers and Fabrics by FT-IR PAS", ACS National Meeting, Division of Cellulose, Paper and Textile (14), September 1985, Chicago, Illinois.

155. C. Q. Yang, T. J. Ellis, R. R. Bresee, W. G. Fateley, "The Depth Profiling of FT-IR Photoacoustic Spectroscopy and Its Applications in Polymeric Material Studies", ACS National Meeting, Division of Polymeric Materials Science and Engineering (36), September 1985, Chicago, Illinois.

156. C. Q. Yang, W. G. Fateley, "Analytical Applications of FT-IR/PAS", the Twelfth Annual Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies, September 1985, Philadelphia, Pennsylvania.

157. C. Q. Yang, W. G. Fateley, "The Applications of FT-IR Photoacoustic Spectroscopy As A Surface Analysis Technique", 27th Rocky Mountain Conference, July 1985, Denver, Colorado.

158. C. Q. Yang, W. G. Fateley, J. A. Graham, "Analytical Uses of PAS", 1985 International Conference on Fourier and Computerized Infrared Spectroscopy , June 1985, Ottawa, Canada.

159. C. Q. Yang, "The Applications of ESCA and AES in the Studies of Interfacial Adhesion Mechanism of Composite Films", 1985 Pittsburgh Conference, February 1985, New Orleans, Louisiana.

160. C. Q. Yang, W. G. Fateley, "The Effect of Particle Size on FT-IR Photoacoustic Spectra", 1985 Pittsburgh Conference, February 1985, New Orleans, Louisiana.

161. C. Q. Yang, "The ESCA Studies of Bond Failure of Aluminum-Polyethylene Composite Film", 26th Rocky Mountain Conference, August 1984, Denver, Colorado.

162. C. Q. Yang, Q. Zhou, "The Coupling Mechanism of Chromium (III) Fumarato Coordination Compound in the Formation of Aluminum-Polyethylene Composite Film", 6th Symposium on Applied Surface Analysis (B-9), June 1984, Dayton, Ohio.

163. C. Q. Yang, Q. Zhou, "The ESCA and AES Studies of the Interfacial Chemical Bonding between Aluminum and Chromium (III) Fumarato Coordination Compound", 1984 Pittsburgh Conference, March 1984, Atlantic City, New Jersey.