

RAYMOND H FERNANDO

I. EDUCATION

- 09/81 – 07/86 Ph.D. Degree (Polymers & Coatings), North Dakota State University, Fargo, ND
Thesis: Influence of Dynamic Uniaxial Extensional Viscosities and Hydrophobically-Modified, Water-Soluble Polymers in Aqueous Systems.
- 09/75 – 08/79 BS Degree (Chemistry), University of Sri Jayewardenepura, Sri Lanka

II. EMPLOYMENT

ACADEMIC EMPLOYMENT

- 07/02 – Present Arthur C Edwards Endowed Chair; Professor, Department of Chemistry and Biochemistry; Director, Polymers and Coatings Program; California Polytechnic State University, San Luis Obispo, CA
- 06/97 – 06/03 Invited Lecturer - Annual Intensive Coatings Science Short Course, North Dakota State University, Fargo, ND
- 09/81 – 06/85 Graduate Teaching Assistant, Polymers and Coatings Department, North Dakota State University, Fargo, ND 58105
- 10/79 – 12/79 Assistant Lecturer, University of Sri Jayewardenepura, Nugegoda, Sri Lanka

INDUSTRIAL EMPLOYMENT

- 04/99 - 06/02 Lead Research Chemist, Corporate Science & Technology Center, Air Products and Chemicals, Inc., Allentown, PA
Responsibilities: Lead project on hybrid nano-particle additives for industrial coating applications (Product concept successfully transferred to development group). Conduct research on formulation effects on rheology of coatings and adhesives. Run research program on spin coating process dynamics. Provide training and consultation on coating science and rheology
- 08/96 - 03/99 Principal Scientist / Program Manager, Coatings, Building Products Operations, Armstrong World Industries, Inc., Lancaster, PA
Responsibilities: Manage coating research program to support the \$750 million-acoustical ceiling tile business. Develop new product / process concepts. Supervise & coordinate R&D activities of coating research group and new product /process implementation groups. Oversee funding for academic research. Train global organization in coating science & technology at various appropriate levels.
- 08/91 - 07/96 Senior Research Scientist, R&D, Armstrong World Industries, Inc., Lancaster, PA
Responsibilities: Develop coating science & technology base to support new product & process implementation related to core businesses (i.e., resilient floor coverings, ceiling tiles, and rubber cots & aprons for textile machinery). Develop a comprehensive coating research program to support acoustical ceiling tile business. Supervise activities of three to five scientists and technicians.
- 08/89 - 07/91 Research Scientist, R&D, Armstrong World Industries, Inc., Lancaster, PA
Responsibilities: Conduct research to support formulation and application aspects of coatings for resilient floor coverings and acoustical ceiling tiles.
- 08/86 - 07/89 Research Chemist, R&D, Armstrong World Industries, Inc., Lancaster, PA
Responsibilities: Included establishing a state-of-the-art rheology laboratory.
- 01/80 - 08/81 Research Officer, Rubber Technology Division, Ceylon Institute for Scientific & Industrial Research, Colombo, Sri Lanka
Responsibilities: Included conducting research on dynamic mechanical properties of cross-linked natural rubber compounds.

III. PROFESSIONAL ACTIVITIES

- Refereed Papers** “*Nanocomposite and Nanostructured Coatings*”, R. H. Fernando, Chapter 1 in “Nanotechnology Applications in Coatings”, ACS Symposium Series No. 1008 (Edited by R. H. Fernando & L. Sung), American Chemical Society (2009), in press.
- “*Shear-Induced One-Dimensional Alignment of Alumina and Silica Nanoparticles in Coatings*”, E. Sapper, L. Brickweg, B. Floryancic, and R. H. Fernando, Chapter 7 in “Nanotechnology Applications in Coatings”, ACS Symposium Series No. 1008 (Edited by R. H. Fernando & L. Sung), American Chemical Society (2009), in press.

"Effects of Alumina and Silica Nanoparticles on Polyurethane Clear-Coating Properties", M. Clarke, A. Paiz, L. Brickweg, B. Floryancic, and R. H. Fernando, Chapter 11 in "Nanotechnology Applications in Coatings", ACS Symposium Series No. 1008 (Edited by R. H. Fernando & L. Sung), American Chemical Society (2009), in press.

"Scratch Behavior of Nano-Alumina/Polyurethane Coatings", L. Sung, J. Comer, A. M. Forster, H. Hu, B. Floryancic, L. Brickweg, and R. H. Fernando, *J. Coatings Tech. Res.*, 5 (4), 419-430 (2008)

"Shear-induced 1-D alignment of alumina nanoparticles in coatings", L. Brickweg, B. Floryancic, E. Sapper, and R. Fernando, *J. Coatings Tech. Res.*, 4(1), 107-110 (2007)

"Development of a Performance and Environmental Certification System for Recycled Paint Products", D. Jones, H. Sanborn, S. Cassell, B. Addelstone, M. Petruzzi, D. Darling and R. Fernando, *JCT Coatings Tech*, February (2007)

"Nanomaterial Technology Applications in Coatings", R. Fernando, *JCT CoatingsTech*, 1(5), 32-38 (2004)

"Effect of Hydrophilic Size on Structural Phases of Aqueous Nonionic Gemini Surfactant Solutions", M. Nieh, S. K. Kumar, R. H. Fernando, R. H. Colby, and J. Katsaras, *Langmuir*, 20, 9061-9068 (2004)

"Rheology Parameters Controlling Spray Atomization and Roll Misting Behavior of Waterborne Coatings", R. H. Fernando, L. L. Xing, and J. E. Glass, *Progress in Organic Coatings*, 40(1-4), 35 (2000)

"Parameters Influencing the Spray Behavior of Waterborne Coatings", L. L. Xing, J. E. Glass, and R. H. Fernando, *Journal of Coatings Technology*, 71(890), 37 (1999)

"Spray Application of Water-Borne Coatings", L. L. Xing, J. E. Glass, and R. H. Fernando, ACS Symposium Series, No. 663, *Technology for Water-Borne Coatings*, Chapter 15 (1997)

"Dynamic Uniaxial Extensional Viscosity (DUEV) Effects in Roll Application I. Rib and Web Growth in Commercial Coatings", D. A. Soules, R. H. Fernando, and J. E. Glass, *Journal of Rheology*, 32(2), 181 (1988)

"Dynamic Uniaxial Extensional Viscosity (DUEV) Effects in Roll Application II. Polymer Blend Studies", R. H. Fernando and J. E. Glass, *Journal of Rheology*, 32(2), 199 (1988)

"The Influence of Associative Thickeners on Coating Performance: Part IV. Formulation Surfactant Effects", T. Murakami, R. H. Fernando, and J. E. Glass, *J. Oil and Colour Chemists Association*, 71(10), 315 (1988)

"The Influence of Associative Thickeners on Coating Performance: Part III. Variation of Percent Non-Volatile", R. H. Fernando, W. F. McDonald, and J. E. Glass, *J. Oil and Colour Chemists Association*, 69(8), 263 (1986)

"Extensional Viscosity Correlation with Mobility Control Buffer Flow Behavior in Berea Cores", R. H. Fernando, J. E. Glass, and D. A. Burnett, *SPE Publication No. 13584*, Society of Petroleum Engineers, P.O. Box 83386, Richardson, Texas 75083 (1985)

"The Influence of Associative Thickeners on Coating Performance: Part II. Heterodispersed, Hydroxyethyl Cellulose-Stabilized, Vinyl-Acrylic Latex Studies", R. H. Fernando, and J. E. Glass, *J. Oil and Colour Chemists Association*, 67(11), 279 (1984)

"The Influence of Associative Thickeners on Coating Performance: Part I. Small-Particle, All Acrylic Latex Studies", J. E. Glass, R. H. Fernando, and S. K. Eglund-Jongewaard, and R. G. Brown, *J. Oil and Colour Chemists Association*, 67(10), 256 (1984)

"Viscosity Stability of Aqueous Polysaccharide Solutions", J. E. Glass, D. A. Soules, H. Ahmed, S. K. Eglund-Jongewaard, and R. H. Fernando, *SPE Publication No. 11691*, Society of Petroleum Engineers, P.O. Box 83386, Richardson, Texas 75083 (1983)

Patents

"High Light Reflectance and Durable Ceiling Board Coating", K. G. Caldwell and R. H. Fernando, EP0928819, US6103360 (2000)

"Coating System and Method of Applying the Same", K. G. Caldwell, R. H. Fernando, and V. K. Pidugu, EP1054046 (1999)

"Phyllosilicate Containing Aminoplast Wear Layer for Resilient Surface Coverings", R. H. Fernando and W. J. Bohrn, US5124202 (1992)

Other Publications & Presentations

"Nanotechnology Applications in Coatings", R. H. Fernando, Invited paper presented at the ABRAFATI Coating Conference, Sao Paulo, Brazil (2007)

"Nanotechnology Applications in Coatings", R. H. Fernando, Invited paper presented at the SCANZ Coating Conference, Rotorua, New Zealand (2007)

"Nanotechnology Applications in Coatings", R. H. Fernando, Invited paper presented at the REPORT Coating Conference, Buenos Aires, Argentina (2006)

"Utility of Aqueous Polymer Blends in Determining Importance of Extensional Flows in Roll and Other Coating Applications", R. H. Fernando, Invited presentation at Roy W. Tess Award Symposium honoring Prof. J. E. Glass, ACS National Meeting, Washington, D.C. (2005)

"Effects of Alumina Nano-particles on Automotive Clear-Coat Properties", Bryce Floryancic, Lucas Brickweg, and Ray Fernando, Presented at the Western Coatings Conference, Las Vegas, NV (2005)

"Gloss Control of Titanium Dioxide Pigmented, Waterborne, Industrial Coatings", Brett Beauregard, Ryan Garcia, Mike Greene, and Ray Fernando, Presented at the Western Coatings Conference, Las Vegas, NV (2005)

"Effects of Rheology Modifiers on a Semi-Gloss Architectural Coating", Laura Johnson and Ray Fernando, Poster presented at the Western Coatings Conference, Las Vegas, NV (2005)

"Effects of Rheology Modifiers on a Semi-Gloss Architectural Coating", Laura Johnson and Ray Fernando, Presented at the Golden Gate Society for Coatings Technology Meeting, San Francisco, CA (2005)

"Utility of Aqueous Polymer Blends in Determining Importance of Extensional Flows in Roll and Other Coating Applications", R. H. Fernando, Presented at PMSE Tess Award Symposium, ACS Fall Meeting, Washington, DC (2005)

"Effects of Alumina Nanoparticles on Automotive Clear Coats", Lucas Brickweg, Bryce Floryancic, and Ray Fernando, Presented at the FSCT Symposium on Nanotechnology in Coatings: Realizing the Potential, Seattle, WA (2005)

"Interactions of Surfactants with HEAT and HEUR Associative Thickeners", R. H. Fernando, Invited Presentation, Proceedings of Asia Pacific Coating Conference, Singapore (2005)

"Interactions of Surfactants with HEAT and HEUR Associative Thickeners", Ryan Garcia, Anita Wongosari, Lucas Brickweg, Megan Dietz, Gary Deng, and Ray Fernando, Proceedings of FSCT Annual Meeting Technical Program, Philadelphia, PA (2004)

"Nanomaterial Applications in Coatings", R. H. Fernando, Invited Presentation at Detroit Society for Coatings Technology FOCUS Conference, Detroit, MI (2004)

"Nanoparticle Applications in coatings", R. H. Fernando, Invited Presentation, Proceedings of Asia Pacific Coating Conference, Bangkok, Thailand (2004)

"Determination of Polymeric Surfactant/Surfactant Interactions via Rheological Methods", Ryan Garcia, Anita Wongosari, and Ray Fernando, ACS Spring National Meeting, Anaheim, CA (2004)

"Associative Thickener – Surfactant Interactions", Ryan Garcia, Jeff Liao, and Ray Fernando, Poster Presented at International Coatings Exposition, Philadelphia, PA (2003)

"Nano-Particle Applications in Coatings", R. H. Fernando, Presented at LASCT PIC Conference, Buena Park, CA, and Golden Gate and Pacific Northwest Coating Society Monthly Meetings in San Francisco, CA, Portland, OR, Seattle, WA, and Vancouver, BC (2003)

"Rheological Performance of Associative Thickeners and Cellulose Ethers in Architectural Coatings", R. H. Fernando, Presented at Asia Pacific Coatings Conference, Kuala Lumpur, Malaysia (2003)

"Impact of Coating Formulation Variables on Rheological Performance of Associative Thickeners", R. H. Fernando, Presented at Western Coatings Symposium, Reno, NV (2003)

"Effects of Latex Particle Stabilizing Package on Rheological Responses of Waterborne Coatings Containing Associative Thickeners", R. H. Fernando, R. R. Rieth, J. B. Chelius, T. L. Wickmann, and G. M. Lichner, Proceedings of the Water-Borne, Higher-Solids & Powder Coatings Symposium, 28, 33(2001)

"Rheological Behavior of Vinyl Acetate/Ethylene Copolymer Latex Coating Formulations Containing Associative Thickeners", R. H. Fernando, T. L. Wickmann, M. Louie, and J. B. Chelius, Proceedings of the Annual Meeting Technical Program of the FSCT, 78, 623 (2000)

"Rheology Parameters Controlling Spray Atomization and Roll Misting Behavior of Waterborne Coatings", R. H. Fernando, Presented at the International Conference in Organic Coatings, Athens, Greece (1999)

"Parameters Influencing the Spray Behavior of Waterborne Coatings", L.-L. Xing, J. E. Glass, and R. H. Fernando, International Coating Exposition and Technical Conference, Presentation at Roon Award Competition (1998)

"Impact of Formulation Ingredients on Finish Appearance of Coatings", R. H. Fernando, Presented at Tong-Ji University, Shanghai, China (1998)

"Spray Applications of Low-VOC and Zero-VOC Coatings", L. L. Xing, R. H. Fernando, and J. E. Glass, Proceedings of the ACS Division of Polymeric Materials: Science and Engineering, 76, 29 (1997)

"Particle Size Distribution Effects on Water-Borne Dispersion Coating Performance", R. H. Fernando, Proceedings of the Water-Borne, Higher-Solids & Powder Coatings Symposium, 19, 75 (1992)

"Viscoelastic Behavior in Paper Coating Formulations Containing Associative Thickeners", D. J. Lundberg, K. Alahapperuma, R. H. Fernando, and J. E. Glass, TAPPI Coating Conference Proceedings, 479 (1990)

"Hydrophobically-Modified, Alkali-Swellable Emulsion (HASE) Thickeners", R. H. Fernando, T. Murakami and J. E. Glass, Proceedings of the ACS Division of Polymeric Materials: Science and Engineering, 61, 409 (1989)

"Size Ratio and Other Factors Affecting the Rheology of Latex/Titanium Dioxide Slurries Thickened with Hydrophobically-Modified, Water-Soluble Polymers", R. H. Fernando, and J. E. Glass, Proceedings of the ACS Division of Polymeric Materials: Science and Engineering, 56, 629 (1987)

"Applications of and Complexities in Elongational Flow of Water-Soluble Polymers", D. A. Soules, R. H. Fernando, and J. E. Glass, Proceedings of the ACS Division of Polymeric Materials: Science and Engineering, 57, 118 (1987)

"The Extensional Flow Behavior of Hydrolyzed (30%) Acrylamide / Carbohydrate Polymer Blends", R. H. Fernando and J. E. Glass, Proceedings of the ACS Division of Polymeric Materials: Science & Engineering, 51, 461 (1985)

"The Influence of Binder Characteristics on Rheology of Water-Borne Coatings Containing Hydrophobically-Modified, Water-Soluble Polymers", T. Murakami, R. H. Fernando, and J. E. Glass, Proceedings of the ACS Division of Polymeric Materials: Science and Engineering, 53, 540 (1985)

"The Influence of Percent Non-Volatiles by Volume on Rheology of Waterborne Coatings Containing Hydrophobically-Modified, Water-Soluble Polymers", R. H. Fernando, W. F. McDonald and J. E. Glass, Proceedings of the ACS Division of Polymeric Materials: Science and Engineering, 53, 545 (1985)

"Mechanical Stability of Water-Soluble, Carbohydrate Polymers", D. A. Soules, R. H. Fernando, and J. E. Glass, Proceedings of the ACS Division of Polymeric Materials: Science and Engineering, 53, 555 (1985)

"The Comparative Influence of Shear and Extensional Viscosities on Rib Number and Misting in Roll and Spray Application of Aqueous Polymer Blends and Industrial Coating Formulations", R. H. Fernando and J. E. Glass, Proceedings of the Water-Borne and Higher-Solids Coatings Symposium, New Orleans, Louisiana (1984)

SERVICE TO THE PROFESSIONAL COMMUNITY

Federation of Societies for Coatings Technology (FSCT)

- As Technical Events Coordinating Committee (TECC) Chair, oversee development and implementation of a multitude of scientific and technical events related to coatings.
- Chaired a Task Force that organized and ran "Nanotechnology in Coatings: Realizing the Potential" Symposium held in June, 2005 in Seattle, WA
- As Annual Meeting Program Committee Chair from 2002-2004, reviewed submitted papers, organized paper presentations, proceedings CD and the poster session at the FSCT's annual conference, ICE (International Coatings Expo). In addition, oversaw selection of a number of John A Gordon best paper award and other award recipients.
- Served as a member of the task force that organized and ran a symposium on "Cross-linking for coatings: Meeting the Challenges", held in Orlando, FL in May, 2004.
- Conducted two web-based training events organized by FSCT (Virtual Learning Conferences). The first VLC, conducted in June, 2004 on the topic of Coating Rheology, had about 30 participating sites from various US locations. The second VLC, conducted in September, 2005 on the topic of Nanomaterial Applications in Coatings had about 50 participating sites.
- Lectured as an Instructor in many short courses offered to industry by FSCT

American Chemical Society (ACS)

- Co-Editor of "Nanotechnology Applications in Coatings", ACS Symposium Series Book, 1008, American Chemical Society, 2009, in press.
- Organizer of a symposium on Nanomaterial Applications in Coatings to be held in San Francisco during Fall 2006 National Meeting
- Organized and ran Polymeric Materials: Science & Engineering (PMSE) Division's 2005 Tess Award Symposium to honor Prof. Ed Glass (retired)
- Served as Session Chair for several ACS symposia at national meetings