

Mohammad Reza Badrossamay

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EDUCATION

Ph.D., Polymer and Fiber science (Agriculture and Environmental Chemistry Graduate School), University of California, Davis, Dissertation: “Functionalization of Olefin Polymers and Fibers through Free-Radical Graft Polymerization in Reactive Extrusion”, July 2008

Advisor: Prof Gang Sun,

Masters in Engineering, Fiber science and Textile Chemistry, Isfahan University of Technology (IUT), Isfahan, Iran, February 1999, Thesis: “Investigation of Internal Frictional Forces within Soft Materials”,

Advisor: Prof. S.A. Hosseini Ravandi,

Co. Advisor: Prof. M. Morshed

Bachelor in Engineering, Fiber science and Textile Chemistry, Isfahan University of Technology (IUT), Isfahan, Iran, September 1996,

Advisor: Prof. S. H. Amirshahi

RESEARCH EXPERIENCE

Postdoctoral Follow, Harvard School of Engineering and Applied Science, 11/2008 - present

Design and fabrication of tissue engineering scaffolds with complex 3-D architectures and customized chemistry that mimic the in-vivo tissue environment,

Control of micro- and macro-scale features of the 3- dimensional tissue engineering of muscles and blood vessels,

P.I. Prof. Kevin Kit Parker

Research Associate, UC Davis, 8/2008- 11/2008.

Design and implement a cost-effective method to forming a nano-scale fibrous-polymer web for biological and chemical protective gears and clothing,

P.I. Prof. Gang Sun

Doctoral Research, UC Davis, 2/2004- 7/2008.

Feasibility of polymer functionalization in melt-spinning process to acquire medical application: (1) Carry-out radical-induced grafting during melt-spinning process (2) Optimization of process condition to maximize grafting yield, minimize side reaction, and control the nature of the grafted product to keep its spinnability (3) Characterization and bio-functionality evaluation of grafted polymers,

Prof. Gang Sun,

Research Scientist, Nassaj Pooya Scientific and Research Institute, ISTT, Iran, 1/1999-1/2004.

Lab-scale synthesis of aramid polymers from original monomers to reach highest efficiency,

Master Consultant, Noavaran Goony, Iran, 1/2002-9/2003.

Consulting in manufacturing process of tape yarns and woven sacks made from them, Quality control and process development

Primary Investigator, Textile Department, Yazd University, Iran, 6/1999-6/2003.

Pilot-scale production of polyblend polypropylene fibers and alloys fibers from polypropylene and polyamide 6 or polyethylene terephthalate to improve functionality of polypropylene fibers,

Masters Research, IUT, Iran, 6/1996-2/1999.

Mathematical modeling of internal forces within soft materials such as textile fabrics and evaluating their properties after several finishing processes,

TECHNICAL SKILLS

Processing Equipments

Capillary Rheometer, Twin and Single Screw Extruders, Internal Mixers, Melt-flow Indicator , Electrospinning devices, Melt and Wet spinning facilities,

Analytical Equipments

Nuclear Magnetic Resonance (NMR), Fourier Transform Spectroscopy (FTIR), Attenuated Total Reflection Fourier Transform Infrared (ATR-FTIR), High-performance Liquid Chromatography (HPLC), UV-Vis Spectrophotometer (UV-VIS), Reflectance spectrophotometer, Optical Microscopy, Differential scanning calorimetry (DSC), Thermogravimetric Analysis (TGA), Scanning Electron Microscopy (SEM), Tensile Testing (Instron),

Laboratory Techniques

Cell Culture, Microinjection of Cells, Immunofluorescent staining and imaging, Microcontact Printing, Microfluidics, Sterile Technique, polymer synthesis, Antimicrobial Assessment Standard Tests Applied for Polymer and Fibers,

TEACHING EXPERIENCE

Instructor: UC Davis, Summer 2006, 2007 & 2008, *Introduction to Textiles*

Lectures on basics of textiles like fiber, fabrics and processing of textiles, Division of Textiles and Clothing,

Lecturer: Yazd University, Textile Department, Iran, 9/1999- 9/2003,

Teaching several undergraduate courses such as: Manufactured Fiber Technology, Textile Fibers chemistry and Science, Textile Finishing and coloration, and Developing course work for labs and in-house publication, Guiding research projects for more than twenty undergraduate students,

Teaching assistant:

Winter 2006- Spring 2007, *General Chemistry*

Conducting labs and leading discussions, Chemistry Department, UC Davis,

Fall 2005-2007, *Introduction to textiles*

Conducting labs, leading discussion, examinations, and final evaluations, UC Davis,

AWARDS and HONORS

- Selected student paper at International Nonwovens Technical Conference, Sep.2008, US.
- Selected original student paper at Fiber Society Conference, Oct. 2007, US.

- Jastro-shield Graduate Student Research Scholarship, UC Davis, 2004-2007
- American Association of Textile Chemists and Colorists Graduate Student Research Funds 2004,
- 1st rank post-graduate students, Textile Engineering Department, IUT award, Iran, 1999,
- Graduate Research Fellowship, IUT Research Division, Iran, 1997, 1998,
- 1st rank graduate students, Textile Engineering Department, IUT award, Iran, 1996,
- 2nd rank in graduate school national entrance exam, IUT award, Iran, 1996,

PATENT:

Sun, G., **Badrossamay**, M. R., “Biocidal Fibers”, PCT Int. Application (2008), WO 2008048749.

PUBLICATIONS

Book chapter

“Enhancing Hygiene Animicrobial Properties of Polyolefins”, **Badrossamay**, M.R., Sun, G., “In: *Polyolefin fibers: industrial and medical applications*”, Woodhead Publishing, 2009, pp. 262-287.

Peer- reviewed papers

Badrossamay, M.R, Sun, G., *Macromolecules*, in press,

Badrossamay, M.R, Sun, G., *International Polymer*, in press,

Badrossamay, M.R, Sun, G., *Polymer Engineering & Science*, in press,

Badrossamay, M.R, Sun, G., “Acyclic Halamine Polypropylene Polymer: Effect of Monomer Structure on Grafting Efficiency, Stability and Biocidal Activities”, *Reactive & Functional Polymer*, in press, 68 (12), 1635-1644, (2008).

Badrossamay, M.R, Sun, G., “Durable and Rechargeable Biocidal Polypropylene Polymers and Fibers Prepared by Using Reactive Extrusion”, *J Biomedical Materials Research- Part B* in press,

Badrossamay, M.R, Sun, G., “Rechargeable Biocidal Polypropylene Prepared by Melt Radical Grafting of Polypropylene with Diallyl-Amino Triazine”, *European Polymer J*, 44(3), 734-742, (2008),

Badrossamay, M.R., Hosseini Ravandi, S.A., Morshed, M., “Fundamental Parameters Affecting Yarn-pullout Behavior”, *Journal Textile Institute*, **92**, 279- 286 (2001),

Hosseini Ravandi, S. A., **Badrossamay, M.R.** and Morshed, M., “Effects of Finishing Treatments on the Distribution of Internal Forces within Plain Woven Fabrics”, *Iranian Polymer Journal*, 13(4), 269-273 (2004),

Conference Proceedings:

Badrossamay, M.R. and Sun, G., “Melt-Induced Grafting of N-tert-butyl acrylamide onto Polypropylene and Its Antimicrobial Activity Potential”, *Polymer Preprint* (American Chemical Society, Division of Polymeric Material: Science & Engineering) (Aug. 2008),

Badrossamay, M.R. and Sun, G., “Preparation of Novel Antimicrobial Polypropylene Polymers and Fibers through Reactive Extrusion”, *Polymer Preprint* (American Chemical Society, Division of Polymeric Material: Science & Engineering) (March 2008),

Badrossamay, M.R. and Sun, G., “Melt-Induced Grafting of Polypropylene with N, N-Diallylmelamine with Potent Antimicrobial Activity”, *Fiber Society 2007 Fall Annual Meeting & Technical Conference*, US (Oct. 2007),

Badrossamay, M.R. and Sun, G., “Production of Functionalized Fibers through Reactive Extrusion”, *Polymer Preprints* (American Chemical Society, Division of Polymeric Material: Science & Engineering) (Aug. 2006),

Badrossamay, M.R., Morshed, M. and Fattahi, S., “Effect of Polyblending on Thermal Shrinkage Behavior of Polypropylene Fibers”, *Polymer Fibers 2002, UMIST*, UK (July 2002),

Badrossamay, M.R., Amirshahi, S.H., Morshed, M. and Bidoki, S.M., “Polyblending for the Production of Dyeable Polypropylene Fibers”, *International Spring Technical Meeting of the Fiber Society*, US, (May 2001),

Badrossamay, M.R., Bidoki, S.M., Morshed, M. and Amirshahi, S.H., “Production of Basic-Dyeable Polypropylene fibers via Polyblending”, *JOURNEES D'ETUDES SUR LES POLYMERES, Boumerdès*, (April 2002),

Badrossamay, M.R., Hosseini Ravandi, S.A. and Morshed, M., “Investigation of Internal Friction Forces within Woven Fabrics”, *Int. Conf. Adv. Fiber Material*, Japan (Oct 1999),

Badrossamay, M.R., Amirshahi, S.H., Morshed, M., and Bidoki, S.M., “Polyblending of Polypropylene Fibers to Improve its Dyeability”, *Sixth Iranian Conf. Chemical Engineering*, Iran (April 2001),

ACADEMIC SERVICES:

Graduate Student Representative for Agriculture and Environmental Chemistry Graduate Group,
2006-2007, UC Davis,

PROFESSIONAL AFFILIATION:

- American Chemical Society
- Fiber Society
- American Association of Textile Chemists and Colorists
- Textile Association of Iran

RESEARCH GRANTS

- Co-authored proposal for Defense Threat Reduction Agent (DTRA), (Principal Investigator: *Prof. Gang Sun*), 2008-2010,
- Co-authored proposal for National Textile Center (NTC), (Principal Investigator: Prof. Gang Sun), 2006-2008,
- Co-assistant National Science Foundation (NSF) grant project, (Principal Investigator: Prof. Gang Sun), 2004-2006,