SUNITA SANWARIA

Assistant Professor,
Department of Chemistry,
Deshbandhu College,
University of Delhi, New Delhi

Mailing Addresse: B-11, Krishna Puri
Golimar Sadan, Amer Road
Jaipur, INDIA
Ph: +(91) 8527547792; +(91) 9669577888
Email:sanwaria.sunita@gmail.com

Scholastics

Year	Degree	Institute
2015	Ph.D	Dnoloepartment of Textile Technology, IIT Delhi
2009	M. Tech in Polymer Science	Centre for Polymer Sci. and Engg., IIT Delhi
2004	M. Sc. (Physical Chemistry)	Department of Chemistry, University of Rajasthan
2002	B. Sc. (Botany and Chemistry)	Maharani College, University of Rajasthan
1999	Senior Secondary	CBSE Board
1997	Secondary	CBSE Board

Research Experience

Doctor of Philosophy (2015)
Department of Textile Technology
Indian Institute of Technology, Delhi
Title: Functional Hairy Core Shell Nanofibers via Block Copolmer Nanofiber Self Assembly
Advisors: Dr. Bhanu Nandan, Dr. Rajiv Srivastava
Brief: Recently, a lot of interest has been shown for the synthesis of functional polymer nano-objects due to their potential application in tissue engineering, drug delivery, catalyst carrier, fillers for polymer matrices etc. One of the easiest way to prepare such polymer nano-objects is via block copolymer self-assembly. We focused on the the self-assembled structures of block copolymer which could be used to isolate core-shell polymer nano-objects where the minority block of the copolymer forms the core and majority block forms the shell. Such core-shell polymer nano-objects could be used as hosts for the synthesis of a variety of organic/inorganic materials if the core and/or shell are compose of functional blocks.

Master of Technology (2009)
Center of Polymer Science and Engineering
Indian Institute of Technology, Delhi
Advisor: Prof. S.N Maithi
Title Development and investigation on Polycarbonate/ EPDM-g- MA/Clay ternary

Brief: In this study, both Clay and EPDM-g- MAH rubber were used tosimultaneously improve the toughness and stiffness of Polycarbonate. For this PC/EPDM –g-MAH/organoclay ternary nano-composite prepared using melt blending were subjected to injection molding. The phase morphology, mechanical properties, crystallinity were characterized by SEM, mechanical testing, DSC respectively.

Center of Polymer Science and Engineering
Indian Institute of Technology, Delhi
Advisor: Dr. Josemon Jacob
Title: Development and investigation on Nylon/EPDM-g- MA/binary composite.
Brief: The objective of the project work is to make suitable blends of Nylon-6 and Acrlonitrile-Styrene- Acrylate (ASA) and to evaluate their mechanical properties without adding any compatibilizer. Further, ASA terpolymer was modified by grafting with maleic anhydride. This grafted ASA i.e. modified ASA (MASA) can be useful as a compatiblizer for Nylon-6/ASA blend. Taking the optimum grafted ASA, different compositions were tested

for mechanical properties of Nylon-6/ASA- g- MA/ASA. The purpose here is to modify the interfacial properties of the final blend by grafting dispersed phase with maleic anhydride in presence of an initiator in an extruder.e characterized by SEM, mechanical testing, DSC respectively.

Projects Supervised

- Development of hydrogel based wound care systems (Neha Yadav, B.Tech., IIT Delhi, 2015)
- Agricultural based antimicrobial food packaging (Akshat Choudhary & Hemant, B.Tech., IIT Delhi, 2014)
- Preparation of a bioactive dressing for wound care application (Sachin Hiwale, M.Tech., IIT Delhi, 2012)

Achievements

- Qualified Graduate Aptitude Test in Engineering Examination, 2006
- Awarded with Junior Research Fellowship JRF (CSIR), 2006. Only 3237 out of the 2,65,930 total test takers were offered this prestigious scholarship.
- Offered Shyama Prasad Mukherjee Fellowship SPM, 2006. Only 20% of the top JRF were offered this prestigious fellowship.

Patent

Srivastava, R. K.; Nandan, B.; Kankariya, N.; **Sanwaria, S.**; Pal, J. Solvent free process of making a three dimentional porous scaffold. Indian Patent 847-DEL-2013

Publications

- Jit Pal, **Sunita Sanwaria**, Andriy Horechyy, Manfred Stamm, Rajiv Srivastava, Bhanu Nandan. "Hairy polymer nanofibers via self-assembly of block copolymers" in **Journal of Material Chemistry** 2012, 22, 25102-25107.(Impact factor 6.82)
- **Sunita Sanwaria**, Andriy Horechyy, Manfred Stamm, Rajiv Srivastava, Bhanu Nandan. Synthesis of Silica Nano-objects using Functional Polymer Nano-objects as Nanoreactors. **RSC Advances**.2013, 3, 24009-24012. (Impact factor 3.28)
- **Sunita Sanwaria**, Andriy Horechyy, Manfred Stamm, Rajiv Srivastava, Bhanu Nandan. Helical packing of Nanoparticles Confined in Cylindrical Domains of Self-Assembled Block Copolymer Structure. **Angew. Chem. Int. Ed.** 2014, 53, 9090 –9093. (Impact factor 11.709)
- **Sunita Sanwaria**, Andriy Horechyy, Manfred Stamm, Rajiv Srivastava, Bhanu Nandan. Self-Assembled Template Directed Fabrication of Hollow One-Dimensional Titania Nanostructures. **Nanostructures and Nanoobjects** 6, 2016,14-22.
- **Sunita Sanwaria**, Sajan Singh, Andriy Horechyy, Manfred Stamm, Rajiv Srivastava, Bhanu Nandan. Multifunctional Nanofibers from self-assembled structures of block copolymer/nanoparticle mixtures.
- Pal, J.; **Sanwaria, S**.; Choudhary, A.; Thakur, K.; Nandan, B.; Srivastava, R. K. Thermally Initiated Trans-esterification in Poly(ε-caprolactone) and Its Dependence on Molecular Weight. **J. Polym. Environ**. **2014**, *22*, 479.(Impact factor 1.67)
- Pal, J.; Kankariya, N.; **Sanwaria, S**.; Nandan, B.; Srivastava, R. K. Control on molecular weight reduction of poly(ε-caprolactone) during melt spinning — A way to produce high strength biodegradable fibers. **Mater. Sci. Eng. C 2013**, *33*, 4213. (Impact Factor: 3.08)
- Pal, J.; Sharma, S.; **Sanwaria, S**.; Kulshreshtha, R.; Nandan, B.; Srivastava, R. K. Conducive 3D porous mesh of poly(ε-caprolactone) made via emulsion electrospinning. ***Polymer*** **2014**, *55*, 3970. (Impact Factor: 3.56)
- Aminlashgari, N.; Pal, J.; **Sanwaria, S**.; Nandan, B.; Srivastava, R. K.; Hakkarainen, M. Degradation product profiles of melt spun in situ cross-linked poly(ε-caprolactone) fibers. ***Mater. Chem. Phys.*** **2015**, *156*, 82. (Impact Factor: 2.25)

Research Interests

- Nanofiber synthesis
- Nanotechnology

Fellowships

- Exchange program at Leibniz Institut for Polymerforshung, Dresden, Germany, August till October 2013.

Analytical Skills

Spectrometry

- Fourier Transform Infrared Spectroscopy
- UV-Vis Absorption Spectrometry
- Raman Spectroscopy

Material Characterization

- Differential Scanning Calorimetry
- Dynamic Light Scattering

Microscopy

- Atomic Force Microscopy
- Scanning Electron Microscopy
- Energy Dispersive X-ray Analysis

Teaching Experience

University of Delhi, Deshbandhu College 2007-2016
Indian Institute of Technology, Delhi
Teaching Assistant, Introduction to Fibres 2011-2013
Teaching Assistant, Manufactured Fibre Technology Laboratory 2012-2014

Conference Presentation

- Poster presentation in **International conference** " **FRONTIERS in POLYMER SCIENCES 21-23 May 2013", Sitges, Barcelona** on Synthesis of Organic/Inorganic Hybrid Nanostructures using Functional Polymer Nano- Objects as Nanoreactors.

- Poster presentation in an on **"International Conference Polymers on the Frontiers of Science and Technology"** on Functional Hairy Polymer Nano-objects in **ASIAN POLYMER ASSOCIATION -2013 in Chandigarh.**

- Oral Presentation at the **Young Research Symposium -2013** on Synthesis of Inorganic Nanostructures Templated by Hairy Polymer Nanoobjects at IIT Delhi.

- Oral presentation at **International Conference ASIAN POLYMER ASSOCIATION 2014** "Synthesis of Silica Nano-objects using Functional Polymer Nano-objects as Nanoreactors"at New Delhi.

- Poster presentation in a **National Conference on Nanotechnology and Renewable Energy** on "Synthesis of Silica Nano-objects using Functional Polymer Nano-objects as Nanoreactors" at Jamia Milia Islamia University in Delhi-2014.

- Oral presentation in an **International Conference** on “Fabrication of Multifunctional Nanofibers via Self-Assembly Approach” at **ICMTECH 2016**, University of Delhi, New Delhi.
- International Conference on “Renewable Energy Asia-An International Conference and 4 th SEEForum Meeting” December 2008, IIT Delhi.
- National Symposium on “Recent Advances Chemical Research RACR-05”, May 2005, University of Rajasthan, Jaipur.

Extramural Engagements

- Member, organizing team of Young Research Symposium, March 2013, IIT Delhi.
- Member, organizing team of Open House 2013, IIT Delhi.
- Member, organizing team of Golden Jubilee Young Research Symposium, March 2011, IIT Delhi.
- Member, organizing team of Open House 2012, IIT Delhi.

REFERENCES

Dr. Bhanu Nandan
Department of Textile Technology
Indian Institute of Technology
Hauz Khas, New Delhi – 110016
INDIA
Ph: + (91)-11-26596679
E-mail: bhanunandan@gmail.com

Dr. Rajiv Srivastava
Department of Textile Technology
Indian Institute of Technology
Hauz Khas, New Delhi – 110016
INDIA
Ph :+(91)-11-26596680
Email: rajiv@textile.iitd.ac.in