

Sofia Rangou

M.Sc and PhD in Materials Science & Engineering

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PERSONAL INFORMATION

Date of Birth: 05/07/1981

Place of Birth: Athens

Nationality: Greek

Marital Status: Single

EDUCATION

Apr. '06 - Oct. '09

PhD Candidate Materials Science and Engineering University of Ioannina, Greece with the degree of "Excellent" Title: "Synthesis, Molecular and Morphological Characterization of Non-Linear High Molecular Weight Terpolymers (Miktoarm Stars and Dendrimers)" Supervisor: Associate Prof. A.Avgeropoulos

Nov. '04 - Nov. '06

MSc Diploma in "Chemistry and Technology of Materials", University of Ioannina, Greece with the degree of "Excellent". Title: "Synthesis, Molecular and Morphological Characterization of 2nd Generation Dendritic Homopolymers and Copolymers Consisting of Polybutdiene and Polyisoprene with Different Microstructures" Supervisor: Associate Prof. A.Avgeropoulos

Sept. '99 - Sept. '04

Diploma of Materials Science and Engineering Department, University of Ioannina, Greece with the degree of "Very Good" (7,28 in the scale of 10) Major: Polymeric Materials

June '99

Graduated from High School Neochoriou with the degree of "Very Good", (18,4 in the scale of 20).

CAREER HISTORY

Aug. '10 - today

Researcher in the Institute of Polymer Research, Helmholtz-Zentrum Geesthacht GmbH, Germany

Job description: Synthesis of Block Copolymers for Membrane Applications in the Field of Biological Waste Filtration. Molecular Characterization of Polymers by Size Exclusion Chromatography and Laser Light Scattering. Morphological Characterization of Polymers using Transmission Electron Microscopy, Small Angle X-Ray Scattering.

Role: Major Researcher

Jan. '10 - Aug. '10

Post Doctoral Researcher in the Institute of Polymer Research, Helmholtz-Zentrum Geesthacht GmbH, Germany funded by a 12 month Grand from Helmholtz-Zentrum Geesthacht.

Job description: Synthesis of Block Copolymers for Membrane applications with aim the improvement of their physicochemical and mechanical properties.

Role: Major Researcher

Apr. '06 - Oct. '09

PhD research, Materials Science and Engineering Department, University of Ioannina, Greece

Major: Complex Architected Polymeric Materials with applications as photonic crystals and Nanocomposites by incorporating multiple size nanoparticles

Nov. '08 - Dec '09

European Union Financed Programme entitled: "Carbon Nanotube Confinement Strategies to Develop Novel Polymer Matrix Composites" (1/11/2008-30/10/2012) with short name "POCO", total amount 340.200 € (18 participants, total amount required by the E.U.: 5.524.450 €)

Job description: Synthesis of Block Copolymers for the development of Carbon Nanotube Composites.

Role: Major Researcher

Oct. '04 - Oct. '09

Teaching Assistant in Polymeric Materials Laboratory, University of Ioannina, Greece (Obligatory Undergraduate Course 20hours/week, 8 weeks/semester, 5 semesters)

Feb. '09 - May '09

Participation in Scientific research projects in the U.S. as a Visiting Scientist at MIT / Institute of Soldier Nanotechnologies (ISN)

- Visit description: Morphological Characterization of Complexed Architectures Synthesized Copolymers and Terpolymers
Role: Major Researcher
- Jan. '08 - Feb. '08** **Visiting Scientist participating in a research project, with the Leibniz Institute for Polymer Research Dresden eV, Germany**
Job description: Preparation of Polymer Nanocomposite Magnetic Brushes, and Potential Applications.
Role: Major Researcher
- Jul. '07 - Aug. '07** **Participation in Scientific research projects in the U.S. as a Visiting Scientist at MIT / Institute of Soldier Nanotechnologies (ISN)**
Visit description: Morphological Characterization of Complexed Architectures Synthesized Copolymers
Role: Major Researcher
- Nov. '06 - Oct. '08** **Hellenic Ministry of Development, General Secretariat for Research and Technology, International R&T Cooperation Directorate, Bilateral Relations Division, (1/11/2006-30/10/2008)** entitled: "Structure Formation and Structure-Property Relations in Self-Organized Block Copolymer/Nanoparticle Composite Materials", total budget: 60.000 € (in collaboration with Department of Materials Science & Engineering, Carnegie-Mellon University)
Job description: Synthesis of Linear and non Linear Block Copolymers with various segments.
Role: Major Researcher
- Apr. '05 - Dec. '08** **Hellenic Ministry of National Education & Religious Affairs, Managing Authority of Operational Programme "Education and Initial Vocational Training" PITHAGORAS II (1/4/2005-31/12/2008)**, entitled: "Synthesis and Theoretical Study of Linear and Complex Architecture Polypeptides", total budget: 50.000 €
Job description: Synthesis Molecular Characterization of Cyclic Polypeptides. Verification of experimental results with theoretical predicted by computer imulations.
Role: Major Researcher
- May. '04 - Dec. '07** **Hellenic Ministry of National Education & Religious Affairs, Managing Authority of Operational Programme "Education and Initial Vocational Training" PITHAGORAS I (1/5/2004-31/12/2007)**, entitled: "Experimental and Theoretical Study of Dendritic Polymers" total budget: 60.000 €
Job description: Synthesis Molecular and Morphological Characterization of Thermoplastic Elastomer Homopolymers and Copolymers with Dendritic Architectures. Verification of experimental results with theoretical predicted by computer simulations.
Role: Major Researcher

ADDITIONAL INFORMATION

Languages:

- English Excellent Knowledge with technical and commercial terminology. ("Certificate of Proficiency in English", University of Cambridge June 2002, and "Certificate of Proficiency in English", University of Michigan March 2002)
- German Very Good Knowledge (Mittelstufenprüfung" of the Goethe-Institute January 2004, and the "National Certificate for the German Language")
- Greek Native Language

Technical Skills:

- Characterization Techniques Size Exclusion Chromatography, Laser Light Scattering, Membrane Osmometry, Polarized Microscopy, Transmission Electron Microscopy, Scanning Electron Microscopy, Ultracryomicrotoming, Small Angle X-Ray Scattering
- Operating Systems Microsoft Windows Operating System. Linux Operating System
- Programs Microsoft Office, AutoCAD, Mathematica and Origin Lab.
- Programming Languages FORTRAN 77 and C
- International Journals Referee** European Polymer Journal since 2008

Member of Scientific Societies

American Chemical Society since 2009

PUBLICATIONS

International Journals

1. "[Synthesis, Molecular Characterization and Theoretical Study of First Generation Dendritic Homopolymers of Butadiene and Isoprene with Different Microstructures](#)" S. Rangou, P. E. Theodorakis, L. N. Gergidis, A. Avgeropoulos, P. Efthymiopoulos, D. Smyrniaios, M. Kosmas and C. Vlahos. *Polymer*, 2007, 48, 652.
2. "[Synthesis, Molecular and Morphological Characterization of 2nd Generation Dendritic Copolymers of Butadiene and Isoprene with Different Microstructures](#)" A. Avgeropoulos, S. Rangou, V. Krikorian and E. L. Thomas. *Macromolecular Symposia*, 2008, 267, 16.
3. "[Synthesis of Silylated Styrenic Monomers and Copolymerization with 1,3-cyclohexadiene. Molecular and Morphological Characterization](#)" K. Misichronis, S. Rangou, A. Avgeropoulos. *International Journal of Polymer Analysis and Characterization*, 2008, 13, 136.
4. "[Synthesis of Dendritic Terpolymers Consisting of Polystyrene, Polybutadiene and Polyisoprene with Different Isomerisms](#)" S. Rangou and A. Avgeropoulos. *Journal of Polymer Science Part A: Polymer Chemistry*, 2009, 47, 1567.
5. "[Effect of Chain Architecture on the Compatibility of Block Copolymer / Nanoparticle Blends](#)" J. Listak, I. F. Hakem, H. J. Ryu, S. Rangou, N. Politakos, K. Misichronis, A. Avgeropoulos and M. R. Bockstaller. *Macromolecules*, 2009, 42, 5766.
6. "[Synthesis and Chemical Modification of Magnetic Nanoparticles covalently bound to polystyrene-SiCl₂-poly\(2-vinylpyridine\)](#)", D. Serrano-Ruiz, S. Rangou, A. Avgeropoulos, N. E. Zafeiropoulos, E. López-Cabarcos and J. Rubio-Retama, *Journal of Polymer Science Part B: Polymer Physics*, 2010, 48, 1668.
7. "[Poly\(vinyl trimethylsilane\) and block copolymers of vinyl trimethylsilane with isoprene: anionic polymerization, morphology and gas transport properties](#)" S. Rangou, S. Shishatskiy, V. Filiz and V. Abetz, *European Polymer Journal*, Article in Press (corrected Proof).
8. "Nanocomposites of Polystyrene-b-Polyisoprene-b-Polystyrene Triblock Copolymer With Layered Silicates and Carbon Nanotubes" A. Enotiadis, S. Rangou, N. Georgiou, D. Gournis, Avgeropoulos A. and Triantafyllidis K. Submission to *Macromolecules*

CONFERENCES

1. **XX Greek Solid State Physics and Material Science Conference, Technological Park of Epirus, Ioannina 2004, Greece.** Poster Presentation with the title: "*Morphological Characterization of Miktoarm Star Terpolymers Consisting of Polystyrene, Polyisoprene and Polybutadiene.*", Rangou S., Avgeropoulos A., Dounavi R., Hadjichristidis N.
2. **XXI Greek Solid State Physics and Material Science Conference, University of Cyprus, Nicosia 2005, Cyprus.** Poster Presentation with the title: "*Synthesis and Molecular Characterization of Dendritic Homo- and Copolymers Consisting of Poly(butadiene) and Poly(isoprene) with Different Microstructures*", Rangou S. Avgeropoulos A.
3. **XXII Greek Solid State Physics and Material Science Conference, University of Patras, Patras 2006, Greece.** Poster Presentation with the title: "*Synthesis, Molecular and Morphological Characterization of Dendritic Copolymers Consisting of Poly(butadiene) and Poly(isoprene) with Different Microstructures*", Rangou S., Avgeropoulos A., Krikorian V. and Thomas E. L.
4. **46th Microsymposium on Nanostructured Polymers and Polymer Nanocomposites, Prague 2007, Czech Republic.** Oral Presentation by Prof. A. Avgeropoulos with the title: "*Synthesis, Molecular and Morphological Characterization of 2nd Generation Dendritic Copolymers of Butadiene and Isoprene with Different Microstructures*" Avgeropoulos A., Rangou S., Krikorian V. and Thomas E. L.
5. **American Chemical Society, 234th National Meeting & Exposition, Boston 2007, USA.** Poster Presentations with the titles:
"*Synthesis Molecular and Morphological Characterization of 2nd Generation Dendritic Copolymers of Butadiene and Isoprene with Different Microstructures*" Rangou S., Avgeropoulos A., Krikorian V., Thomas E. L.
"*Synthesis of Silylated Styrenic Monomers and Copolymerization with 1,3-cyclohexadiene. Nanoporous and Nanorelief Composite Materials.*" Misichronis K., Rangou S. and Avgeropoulos A.
6. **21st International Symposium on Polymer Analysis and Characterization, Agios Nikolaos, Crete 2007, Greece.** Poster Presentations with the titles:
"*Synthesis and Self-Assembly of 2nd Generation Dendritic Copolymers of Butadiene and Isoprene with Different Microstructures*" Rangou S., Avgeropoulos A., Krikorian V., Thomas E. L.
"*Synthesis of Silylated Styrenic Monomers and Copolymerization with 1,3-cyclohexadiene. Molecular and Morphological Characterization.*" Misichronis K., Rangou S., and Avgeropoulos A.

7. **4th IUPAC-Sponsored International Symposium on Macro- and Supramolecular Architectures and Materials Dusseldorf 2008, Germany.** Oral Presentation by Prof. A. Avgeropoulos with the title: "*Synthesis and Characterization of 2nd Generation Dendritic Terpolymers*" A. Avgeropoulos, S. Rangou and E. L. Thomas.
8. **7th Hellenic Polymer Conference, Ioannina 2008, Greece.** Poster Presentations with the titles:
 - "*Synthesis and characterization of 2nd generation dendritic copolymers*" S. Rangou, E.L. Thomas, A. Avgeropoulos
 - "*Synthesis of poly(α -methylstyrene-*b*-4-hydroxystyrene) diblock copolymers via anionic polymerization*". Evangelou, C. Ntaras, S. Rangou, A. Avgeropoulos.
 - "*Synthesis of graft copolymers with divinyl - terminated poly(dimethylsiloxane) and polystyrene ("grafting to" approach)*" C. Ntaras, G. Evangelou, S. Rangou, A. Avgeropoulos, R.M. Hill.
 - "*Synthesis, molecular and morphological characterization of linear triblock terpolymers where one of the blocks is poly(cyclohexadiene)*" K. Misichronis, S. Rangou, E. Ashcroft, J. W. Mays, A. Avgeropoulos.
 - "*Synthesis and characterization of high molecular weight linear triblock terpolymer consisting of polystyrene, polybutadiene, polyisoprene with different isomerisms*" G. Zapsas, S. Rangou, A. Avgeropoulos, E. L. Thomas.
 - "*Incorporation of magnetic nanoparticles in a PI_{3,4}-*b*-PB_{1,4} polymeric matrix*" A. Tomou, A. Enotiadis, S. Rangou, M. Kitsas, A. P. Douvalis, A. Avgeropoulos, I. Panagiotopoulos, D. Gournis, T. Bakas.
9. **American Chemical Society, 235th National Meeting, New Orleans 2008, USA.** Oral Presentation by Prof. M. R. Bockstaller with the title: "*Effect of Chain Architecture on Particle Miscibility in Block Copolymer-Nanoparticle Blends*" Listak J., Ryu H. - J., Rangou S., Politakos N., Misichronis K., Avgeropoulos A. and Bockstaller M. R.
10. **American Chemical Society, 239th National Meeting, San Francisco 2010, USA.** Oral Presentation by Prof. A. Avgeropoulos with the title: "*Synthesis Molecular and Morphological Characterization of Dendritic Terpolymers Consisting of Polystyrene, Polybutadiene and Polyisoprene with Different Isomerisms*" S. Rangou, A. Avgeropoulos, E.L Thomas.
11. **8th Hellenic Polymer Conference, Hersonisos Heraklion 2010, Crete, Greece.** Poster Presentations with the titles:
 - "*Synthesis of Graft Quaterpolymers with Dininyl-terminated Poly(dimethylsiloxane) and PS-*b*-PB-PI_{3,4} Triblock*" C. Ntaras, S. Rangou, E. L. Thomas, C. Stewart-Sloan, A. Avgeropoulos.
 - "*Synthesis and Characterization of High Molecular Weight Triblock Terpolymers Consisting of Poly(styrene) Poly(butadiene) and Poly(isoprene) with Different Isomerisms*" D. Moschovas, G. Zapsas, S. Rangou, N. E. Zafeiropoulos, A. Avgeropoulos.
 - "*Synthesis, Molecular and Morphological Characterization of Linear Triblock Terpolymers where one of the Blocks is Ppoly(cyclohexadiene)*" K. Misichronis, S. Rangou, E. Ashcroft, J.W. Mays, A. Avgeropoulos.
 - "*Core Shell Double Gyroid Morphology of a Triblock Terpolymer Consisting of: Poly(styrene) Poly(butadiene) and Poly(isoprene)*" G. Zapsas, D. Moschovas, S. Rangou, N.E. Zafeiropoulos, A. Avgeropoulos.
 - "*Chemical Modification of Magnetic Nanoparticles By Covalently Bonding Middle Functionalized Diblock Copolymer*" S. Rangou, D. Serrano-Ruiz, A. Avgeropoulos, N.E. Zafeiropoulos, E. Lopez Cabarcos, J. Rubio-Retama.
 - "*Poly(vinyl trimethylsilane) and Block Copolymers of Vinyltrimethylsilane with Isoprene: Anionic Polymerisation, Morphology and Gas Transport Properties*" S. Rangou, S.Y Shishatskiy, V. Filiz, V. Abetz.

Scientific Leadership

The Post Doctoral Researcher is a newly awarded PhD scientist (date of PhD awarded: October 14th 2009, defended: October 1st 2009) from the Department of Materials Science & Engineering, University of Ioannina, Greece. She is an expert on the anionic polymerization of monomers and has synthesized linear, non-linear and dendritic homo- co- and terpolymers, which were characterized both molecularly and morphologically. Her research work has already led to 6 publications as well as to 1 accepted and 3 under preparation manuscripts. Due to her young scientific age her work is still not highly cited but according to the research employed as well as the interest towards the specific topics from the Polymer Science Community it will adequately promote. The international journals she has published her results exhibit relatively high impact factors such as: *Macromolecules*, *Polymer*, *Journal of Polymer Science Part A: Polymer Chemistry*, *Journal of Polymer Science Part B: Polymer Physics*, *European Polymer Journal*, with presentations of her work in domestic (Greece) and international Conferences (11 in total). She was the first scientist to report the synthesis via anionic polymerization of dendritic terpolymers of the (ABC)₃ type polymeric materials. Additionally, her research along with the research work of Prof. Dr. Apostolos Avgeropoulos on the microphase separation of polydienes is expected to make a great impact in the coming years. One of her major research studies is the microphase separation of copolymers and/or terpolymers consisting of polydienes with specific microstructures.

Her experience in working abroad [she have visited as a graduate student twice the United States (supervisor Moris Cohen Prof. E. L. Thomas), once Germany (Prof. M. Stamm - Leibniz Institute for Polymer Research Dresden - supervisor Dr. N. Zafeiropoulos) and now she is an employee of the Helmholtz Community (under the guidance of Prof. V. Abetz)] gave her the opportunity to work and interact with various types of people coming from different scientific and cultural background and also to expand her research activities. She can literally do it all: from the synthesis of various types linear and non linear polymers up to their molecular and morphological characterization in solution and in bulk respectively. During her visits in the United States (4 months in total) she managed to publish one article in *Macromolecular Symposia* and has three more articles under preparation. Her stay in the Leibniz Institute for Polymer Research, Dresden has lead to 1 publication at *Journal of Polymer Science: Part B: Polymer Physics*.

Her ability to relate well with others and to establish strong working relationships has also helped her fast evolution from a Post Doctoral Affiliate into a Primary Researcher at the Institute of Polymer Research, in the Helmholtz Research Center Geesthacht. During the first eight months of her Post Doctoral affiliation she managed to become familiar with all the necessary instrumentation and to be able to create a working group only two months after her appointment. Subsequently, she became an important partner for Prof. V. Abetz who promoted her into a Primary Researcher. Her duties involve the supervision of the Anionic Laboratory of the Institute, the Polymer Characterization by Size Exclusion Chromatography, Laser Light Scattering, Transmission Electron Microscopy and Small Angle X-Ray Scattering, as well as the co-supervision of one PhD student. It is worthwhile to mention that she was employed as a Teaching Assistant in Polymeric Materials Laboratory, University of Ioannina, Greece for 5 semesters during her PhD research.

Therefore, it is believed that with additional funding in order to cover her salary, travel expenses, the assistance from research staff needed she will become an independent research leader in the years to come combining the scientific areas of specialized anionic synthesis, characterization (molecular, morphological) with applicable surface science.