

## Suk-kyun Ahn

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### EDUCATION

University of Connecticut, Storrs, CT	Polymer Science	Ph.D., 2011
Sogang University, Seoul, Korea	Chemical Engineering	B.S., <i>Magna Cum Laude</i> , 2006

### PROFESSIONAL EXPERIENCE

09/2011-present Postdoctoral Research Associate, Center for Nanophase Materials Sciences, Oak Ridge National Laboratory, Oak Ridge, TN  
09/2006-08/2011 Graduate Research Assistant, Polymer Program, University of Connecticut, Storrs, CT

### HONORS & AWARDS

2011 Graduate Summer Research Award (University of Connecticut)  
2011 The Samuel J. Hwang Graduate Research Award (University of Connecticut)  
2010 Best Poster Award (Materials Research Society (MRS), Fall Meeting)  
2010 Graduate Student Travel Award (Materials Research Society (MRS), Fall Meeting, Symposium L. "Liquid Crystal Materials: Beyond Display")  
2006 Magna Cum Laude (Sogang University)

### RESEARCH INTERESTS

- *Nanoporous Block Copolymer Thin Films for Active Layers in Organic Photovoltaics (OPVs)*  
We design and synthesize bottle-brush type block copolymers with poly(3-alkylthiophene) and poly(D,L-lactide) as two different and incompatible side-chains, which can lead various self-assembled structures in nanometer scale. Nanoporous structures of these block copolymers can be achieved after hydrolysis of degradable poly(D,L-lactide) side-chains, of which pores will be eventually replaced with electron acceptor materials such as [6,6]-phenyl-C<sub>61</sub>-butyric acid methyl ester (PCBM) to be served as active layers in organic photovoltaic applications.
- *Stimuli-Responsive Materials Using Side-Chain Liquid Crystalline Polymers (SCLCPs)*  
: Liquid crystalline (LC) materials are known for their intrinsic sensitivity to various stimuli such as temperature, light, electric and magnetic field as well as for their self-assembled nanostructures which lead different mesophases including nematic, smectic and cholesteric mesophases. We investigate and exploit the self-assembled nanostructures of side-chain liquid crystalline polymers (SCLCPs) for thermoresponsive sensors, actuators or shape-memory devices.

### GRADUATE & POSTDOCTORAL ADVISORS

- *Graduate Advisor:* Prof. Rajeswari M. Kasi (University of Connecticut)
- *Postdoctoral Advisor:* Prof. S. Michael Kilbey II (University of Tennessee, Knoxville & ORNL)

## PUBLICATIONS

1. P. Deshmukh, S-k. Ahn, M. Gopinadhan, C. O. Osuji, R. M. Kasi, "Molecular Engineering of Side-Chain Liquid Crystalline Random Copolymer Brushes to Create Multi-Level Hierarchical Photonic Materials" *J. Am. Chem. Soc.* **2012** (*Submitted, under revision*)
2. S-k. Ahn, M. Gopinadhan, P. Deshmukh, R. K. Lakhman, C. O. Osuji, R. M. Kasi, "Effect of Interdigitation on Phase Changes in Side-Chain Liquid Crystalline Polymers Bearing Cholesteryl Mesogens" *Soft Matter* **2012**, *8*, 3185-3191.
3. S-k. Ahn, R. M. Kasi, "Exploiting Microphase Separated Morphologies of Side-Chain Liquid Crystalline Polymer Networks for Triple Shape Memory Properties" *Adv. Funct. Mater.* **2011**, *21*, 4543-4549.
4. Y. Zhou, S-k. Ahn, R. K. Lakhman, M. Gopinadhan, C. O. Osuji, R. M. Kasi, "Tailoring Crystallization Behavior of PEG Based Liquid Crystalline Block Copolymers through Variation in Liquid Crystalline Content" *Macromolecules* **2011**, *44*, 3924-3934.
5. S-k. Ahn, P. Deshmukh, M. Gopinadhan, C. O. Osuji, R. M. Kasi, "Side-Chain Liquid Crystalline Polymer Networks: Exploiting Nanoscale Smectic Polymorphism to Design Shape Memory Polymers" *ACS Nano* **2011**, *5*, 3085-3095.
6. S-k. Ahn, P. Deshmukh, R. M. Kasi, "Shape Memory Behavior of Side-Chain Liquid Crystalline Polymer Networks Triggered by Dual Transition Temperatures" *Macromolecules* **2010**, *43*, 7330-7340.
7. Y. Zhou, V. A. Briand, N. Sharma, S-k. Ahn, R. M. Kasi, "Polymers Comprising Cholesterol: Synthesis, Self-Assembly and Applications" *Materials* **2009**, *2*, 636-660.
8. S-k. Ahn, L. T. Nguyen, R. M. Kasi, "Synthesis and Characterization of Side-Chain Liquid Crystalline Polymers Bearing Cholesterol Mesogen" *J. Polym. Sci. Part A: Polym. Chem.* **2009**, *47*, 2690-2701.
9. S-k. Ahn, R. M. Kasi, S-C. Kim, N. Sharma, Y. Zhou, "Stimuli-Responsive Polymer Gels" *Soft Matter* **2008**, *4*, 1151-1157. *The top ten most accessed and downloaded papers of May 2008 among Soft Matter articles.*

## BOOK CHAPTERS

1. S-k. Ahn, P. Deshmukh, R. M. Kasi, "Exploiting Architecture and Composition of Side-Chain Liquid Crystalline Polymers for Shape Memory Applications" *ACS Symposium Series, "Non-Conventional Functional Block Copolymers"* **2011**, *1066*, 39-51.

## CONFERENCE PROCEEDINGS / PRESENTATIONS (*underline indicates presenter*)

1. S-k. Ahn, D. L. Pickel, W. M. Kochemba, S. M. Kilbey II, "Conjugated Bottle-Brush Polymers Incorporating Poly(3-Hexylthiophene) as Brush Side-Chains" Annual CNMS User Meeting, Oak Ridge, TN, Sep (2012).
2. S-k. Ahn, D. L. Pickel, W. M. Kochemba, S. M. Kilbey II, "Facile Synthetic Route for Conjugated Bottle-Brush Polymers" IUPAC MACRO, Blacksburg, VA, June (2012).

3. P. Deshmukh, **S-k. Ahn**, R. M. Kasi, “Self-Assembled Hierarchical Structure from Side-Chain Liquid Crystalline Block Copolymer Brushes” MRS Fall meeting, Boston, MA, Nov (2011).
4. R.M. Kasi, **S-k. Ahn**, Y. Zhou, P. Deshmukh, R. K. Lakhman, N. Sharma, V. A. Briand, “Multi-Functional Smart Materials from Hierarchically Ordered Polymeric Systems” MRS Fall meeting, Boston, MA, Nov (2010).
5. **S-k. Ahn**, P. Deshmukh, R. M. Kasi, “Effect of Smectic Layer Interdigitation on Shape Memory Properties for Side-Chain Liquid Crystalline Polymer Networks” MRS Fall meeting, Boston, MA, Nov (2010).
6. **S-k. Ahn**, R. M. Kasi, “Effect of Interdigitation on Phase Changes in Side-Chain Liquid Crystalline Polymers Bearing Cholesterol” MRS Fall meeting, Boston, MA, Nov (2010).
7. **S-k. Ahn**, P. Deshmukh, R. M. Kasi, “One-Way Shape Memory Properties of Smectic A Liquid Crystalline Elastomers Triggered by Dual Transition Temperatures” *Polymer Preprints, (ACS, POLY)* **2010**, 51 (2), 430.
8. **S-k. Ahn**, R. M. Kasi, “Shape Memory Behavior of Side-Chain Liquid Crystalline Copolymers Bearing Cholesterol” MRS Fall meeting, Boston, MA, Nov (2009).
9. **S-k. Ahn**, R. M. Kasi, “Liquid Crystalline Polymers Bearing Cholesterol Units” *Polymer Preprints, (ACS, PMSE)* **2009**, 101,1080.
10. **S-k. Ahn**, D. Penaloza, D. J Sandberg, R. M. Kasi, T. A.P. Seery. “Nanocomposites from Silica Nanoparticles Polynorbornenes with Pendant Cholesterols” *Polymer Preprints, (ACS, POLY)* **2008**, 49 (2), 760-761.
11. **S-k. Ahn**, R. M. Kasi, “Synthesis and Characterization of Liquid Crystalline Polymers Bearing Cholesterol Side-Chains: Towards Temperature Responsive Polymers” 37th Northeast regional meeting of the ACS, Burlington, VT, June (2008).
12. R. M. Kasi, **S-k. Ahn**, Y. Zhou, N. Sharma, “Design of Novel Nanostructured Cholesteric Stimuli-Responsive Polymers” *Polymer Preprints, (ACS, PMSE)* **2008**, 49 (1), 322.