

## Jill N. Kunzelman

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### **OBJECTIVE**

Industrial position focusing on research and development of polymeric materials

### **EDUCATION**

CASE WESTERN RESERVE UNIVERSITY      Expected: Summer 2008      Cleveland, OH  
**Doctor of Philosophy, Macromolecular Science and Engineering**  
Thesis: "*Polymers with Integrated Sensing Capabilities*"  
Research Advisor: Dr. Christoph Weder

OHIO NORTHERN UNIVERSITY      May 2004      Ada, OH  
**Bachelor of Science, Chemistry** (American Chemical Society certified); Honors Program

### **WORK EXPERIENCE**

GRAUDATE RESEARCH ASSISTANT      Fall 2004 – present      CWRU, Cleveland, OH

- Design and synthesis of color-changing dyes for use in polymer blends
- Developed novel absorption and photoluminescent one-way color-changing polymer/dye blends for use as visual indicators of strain, time temperature indicators, or humidity integrating sensors
- Developed novel absorption and photoluminescent reversible color-changing polymer/dye blends for use as shape memory materials with built-in temperature sensors
- Aggregation/crystallization kinetics of small molecules in polymer hosts
- Provided technical content for and participated in preparing several research proposals resulting in National Science Foundation and industrial funding

POLYMER SCIENCE INTERNSHIP      Summer 2003      Univ. of Akron, Akron, OH  
*National Science Foundation (NSF) Internship*  
Research Experience for Undergraduates (REU), Advisor: Dr. William J. Brittain

- Formation of polystyrene brushes from silica gel using ATRP
- Characterization of formed brushes in order to determine initiation efficiency of a particular bromo-isobutyrate trichlorosilane ATRP initiator

CHEMISTRY INTERNSHIP      Summer 2002      Kent State Univ., Kent, OH  
*National Science Foundation (NSF) Internship*  
Research Experience for Undergraduates (REU), Advisor: Dr. Rathindra Bose

- Structure determination of [Pt(trpy)GS]<sup>+</sup> using 2-D NMR analysis and molecular dynamics simulation programs and calculations
- Prepared NMR samples with specific attention to pH
- Synthesized [Pt(trpy)GS]<sup>+</sup>

**TECHNICAL SKILLS**

General Techniques:	Lab-Scale Melt-Processing; Small Molecule and Polymer Synthesis
Spectroscopy:	Multinuclear NMR, 2-D NMR, FTIR, PL, UV-Vis, Raman, ICP-OES
Chromatography:	Thin-Layer, Flash, Column, HPLC, GC-MS, GPC
Microscopy:	Optical Microscopy and Scanning Electron Microscopy
Thermal Techniques:	TGA and DSC
Potentiometry:	pH and Ion-Selective

**PUBLICATIONS****Original Scientific Papers (Peer Reviewed)**

- Kunzelman, J.\*; Chung, T.; Mather\*, P. T.; Weder, C. Shape Memory Polymers with Built-In Threshold Temperature Sensors; *J. Mater. Chem.*, **2008**, *18*, 1082-1086. **Back Cover Picture**. \*These two authors contributed equally.
- Kunzelman, J.; Kinami, M.; Crenshaw, B. R.; Protasiewicz, J. D.; Weder, C. Oligo(*p*-phenylene vinylene)s as a “New” Class of Piezochromic Fluorophores; *Adv. Mater.* **2008**, *20*, 119-122.
- Kunzelman, J.; Crenshaw, B. R.; Weder, C. Self-Assembly of Chromogenic Dyes – A New Mechanism for Humidity Sensors; *J. Mater. Chem.*, **2007**, *17*, 2989-2991. **Cover Picture**.
- Crenshaw, B. R.\*; Kunzelman, J.\*; Sing, C. E.; Ander, C.; Weder, C. Threshold Temperature Sensors with Tunable Properties; *Macromol. Chem. Phys.*, **2007**, *208*(6), 572-580. \*These two authors contributed equally.
- Kunzelman, J.; Crenshaw, B. R.; Kinami, M.; Weder, C. Self-Assembly and Dispersion of Chromogenic Molecules: A Versatile and General Approach for Self-Assessing Polymers; *Macromol. Rapid Commun.*, **2006**, *27*(23), 1981-1987. **Cover Picture**.
- Crenshaw, B. R.; Kunzelman, J.; Weder, C.; Polymers with Self-Assessing Capabilities; *The Spectrum* **2005**, *18*, 20-26. **Invited Review**.

**Conference Proceedings**

- Kunzelman, J.; Tang, L.; Sing, C. E. Weder, C. Excimer-Forming Fluorescent Dyes as Sensors; *PMSE Preprints* **2008**, *98*, 196.
- Kunzelman, J.; Crenshaw, B. R.; Kinami, M.; Weder, C.; Self-Assembly of Chromogenic Dyes: Humidity Sensing and Piezochromic Behavior; *Polym. Prepr. (Am. Chem. Soc., Div. Polym. Chem.)* **2007**, *48*(2), 157-157.
- Kunzelman, J.; Crenshaw, B. R.; Weder, C.; Self-Assembly and (De)Aggregation of Conjugated Materials in Solid Polymer Hosts: A General Approach for New Mechanochromic and Thermochromic Materials; *PMSE Preprints* **2006**, *95*, 881-882.
- Crenshaw, B. R.; Burnworth, M.; Kunzelman, J.; Mendez, J.; Smith K.; Weder, C.; Creating Polymer Chameleons – Smart Blends with Self-Assessing Capabilities; *Polym. Prepr. (Am. Chem. Soc., Div. Polym. Chem.)* **2005**, *46*(1), 506-507.

**Lectures**

- “New Polymers with Integrated Sensing Capabilities” Case Western Reserve University, Bayer Fellowship Award Seminar, Department of Macromolecular Science and Engineering, April 25, 2008; Cleveland, OH.
- “Shape Memory Polymers with Built-In Threshold Temperature Sensors” American Chemical Society National Meeting, April 10, 2008; New Orleans, LA.

- “Self-Assembly of Chromogenic Dyes: Humidity Sensing Materials and Piezochromic Behavior” American Chemical Society National Meeting, August 22, 2007; Boston, MA.
- “Polymer Blends with Self-Assessing Capabilities” Ohio Northern University, January 23, 2007; Ada, OH. **Invited Lecture.**
- “Polymer Blends with Self-Assessing Capabilities” Case Western Reserve University, Graduate Student Seminar, Department of Macromolecular Science and Engineering, November 3, 2006; Cleveland, OH.
- “Self-Assembly and (De)Aggregation of Conjugated Materials in Solid Polymer Hosts: A General Approach for New Mechanochromic and Thermochromic Materials” American Chemical Society National Meeting, September 13, 2006; San Francisco, CA.

### **Poster Presentations**

- “Polymer Blends with Self-Assessing Capabilities” Case Western Reserve University, Research ShowCASE 2007, April 12, 2007; Cleveland, OH.
- “Polymer Blends with Self-Assessing Capabilities” Case Western Reserve University, PolyImpact Northeast Ohio (PINO), March 31, 2007; Cleveland, OH.
- “Creating Polymer Chameleons – Smart Polymers with Built-In Temperature and Deformation Sensors” Case Western Reserve University, Research ShowCASE 2006, April 6, 2006; Cleveland, OH.
- “Creating Polymer Chameleons – Smart Blends with Self-Assessing Capabilities” Case Western Reserve University, Research ShowCASE 2005, April 7, 2005; Cleveland, OH.
- “Blends of Excimer-Forming Dyes and Polymers: Smart Systems for Sensor Applications” Case Western Reserve University, Case Anniversary Alumni Weekend, October 15, 2005; Cleveland, OH.

### **RECENT AWARDS**

- Bayer Corporation Fellowship for Excellence in Graduate Study in Macromolecular Science and Engineering, 2008
- Research ShowCASE Graduate Student Poster Contest, Honorable Mention, 2007
- Ford Travel Grant awarded by the PMSE division of ACS for travel support to ACS Fall 2006 meeting
- Case Prime Fellow, 2004-present

### **TEACHING/MENTORING EXPERIENCE**

- Undergraduate Teaching Assistant for Laboratory Classes (Organic Chemistry, Chemistry for Engineers, Physical Chemistry, and Intermediate Inorganic Chemistry)
- Graduate Teaching Assistant for Undergraduate and Graduate Courses (Characterization of Macromolecules, Intro to Polymer Science and Engineering)
- Facility coordinator for maintenance and training on a departmental twin-screw mini-extruder and an optical microscope
- Performed multiple demonstrations about polymers for over 2000 individuals
- Mentored 8 undergraduate students and 1 high school student in various research projects