

AMANDA ASHLEY CAIN

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EDUCATION

- TEXAS A&M UNIVERSITY — **Ph.D. in Materials Science & Engineering** College Station, TX
Expected Dec. 2014
- Dissertation Topic: Develop nanostructured thin films that impart fire resistance
 - GPA: 3.568
- MILLSAPS COLLEGE — **B.S. in Physics** Jackson, MS
2010
- Mathematics and Business Minors; Pre-Engineering Concentration
 - GPA: 3.265

HIGHLIGHTS

- First authored three refereed journal papers, to date, on graduate research
- Strong technical orientation, disciplined problem solving, & personal accountability combined with creative, fact-based, out of the box thinking
- Ability to manage multiple priorities without impacting timelines
- Strong communication, organizational, & collaborative skills with ability to tailor content/context according to audience

RESEARCH EXPERIENCE

- TEXAS A&M UNIVERSITY – POLYMER NANOCOMPOSITES LAB College Station, TX
2010 – present
- Graduate Research Assistant** | Advisor: Dr. Jaime C. Grunlan
- Exploring suitable materials to build nanostructured, anti-flammable thin films via layer-by-layer assembly
 - Investigating optoelectronic properties of sp^2 hybridized carbon allotrope transparent, conductive thin films
 - Fully trained to use materials characterization instruments such as: TEM, SEM, LM, Ellipsometer, Reflectometer, Profilometer, UV-vis, QCM, ZetaPALS, TGA, vertical/horizontal flame testing
 - Trained and supervised six undergraduate research assistants
- RIVER OAKS HOSPITAL - Jackson, MS Spring 2010
- Internship** | Cardiovascular surgeon
- Conducting vascular pressure & occlusion hemodynamic research by developing a model that simulated flow of blood through a calf muscle and collecting measurements for analysis.
- CENTERPOINT ENERGY – Shreveport, LA Summers 2008, 2009
- Internship** | Pipeline Integrity Division
- Compiling data and assisting with engineering projects focused on protecting the pipeline from corrosion.

AWARDS

- POLY OUTSTANDING POSTER AWARD – ACS National Meeting (Dallas, TX) 2014
- HENRY KAHN MEMORIAL SCHOLARSHIP – SPE Scholarship 2012
- WILEY-VCH AWARD FOR BEST MSEN POSTER – International LbL Symposium (Strasbourg, France) 2011

PROFESSIONAL AFFILIATIONS

- Microscopy Society of America 2011- 2012
- Materials Research Society 2011- 2012
- American Chemical Society 2012 – Present
- Society of Plastics Engineers 2011 – Present
- ❖ MSEN Representative 2012- 2013

JOURNAL PAPERS

1. **A. A. Cain**, M. Plummer, T. Smith, L. Boiling, O. Regev, J. C. Grunlan, "Single Polymer/Clay Layer Creates Effective Flame-Retardant Nanocoatings for Polyurethane Foam," **2014**, *in preparation*.
2. A. Mateous,[‡] **A. A. Cain**,[‡] J. C. Grunlan, "Large-Scale Continuous Immersion System for Layer-by-Layer Deposition of Flame Retardant and Conductive Nanocoatings on Fabric," *Industrial & Engineering Chemistry Research* **2014**, *in press*.
3. **A. A. Cain**, S. Murray, K. Holder, C. R. Nolen, J. C. Grunlan, "Aqueous OnePot Polyelectrolyte Complex Extinguishes Flame on Fabric via Intumescence," *Macromolecular Materials & Engineering* **2014**, *in press*.
4. **A. A. Cain**, C. R. Nolen, Y.-C. Li, R. Davis, J. C. Grunlan. "Phosphorous-filled nanobrick wall multilayer thin film eliminates polyurethane melt dripping and reduces heat release associated with fire," *Polymer Degradation and Stability* **2013**, 98, 2645.

- G. Laufer, C. Kirkland, **A. A. Cain**, J. C. Grunlan. "Oxygen barrier of multilayer thin films comprised of polysaccharides and clay," *Carbohydrate Polymers* **2013**, 95, 299.
- G. Laufer, C. Kirkland, **A. A. Cain**, J. C. Grunlan. "Clay-chitosan nanobrick wall: Completely renewable gas barrier and flame retardant nanocoatings," *ACS Applied Materials and Interfaces* **2012**, 4, 1643. **This work was already featured as News of the Week in C&EN (5 SEP 2011), based upon a press conference at the 242nd ACS National Meeting in Denver, CO (30 AUG 2011).**
- Y. S. Kim, R. Davis, **A. A. Cain**, J. C. Grunlan. "Development of layer-by-layer assembled carbon nanofiber-filled coatings to reduce polyurethane foam flammability." *Polymer* **2011**, 52, 2847.

ORAL PRESENTATIONS

- "Aqueous OnePot Polyelectrolyte Complex Extinguishes Flame on Fabric via Intumescence," by **A. A. Cain**, S. Murray, K. Holder, C. R. Nolen, J. C. Grunlan, presented at the 247th American Chemical Society National Meeting & Exposition; Dallas, TX (3/16/2014).
- "Phosphorous-filled nanobrick wall multilayer thin film eliminates polyurethane melt dripping and reduces heat release associated with fire," by **A. A. Cain**, C. R. Nolen, Y.-C. Li, R. Davis, J. C. Grunlan, presented at the 247th American Chemical Society National Meeting & Exposition; Dallas, TX (3/16/2014).
- "Intumescent multilayer nanocoating, made with renewable polyelectrolytes, for flame-retardant cotton" by G. Laufer, C. Kirkland, **A. A. Cain**, A. B. Morgan, and J. C. Grunlan, presented at the 245th American Chemical Society National Meeting & Exposition; New Orleans, LA (4/10/2013).
- "Flame-Retardant Thin Film Assemblies from Completely Renewable Materials" by G. Laufer, C. Kirkland, **A. A. Cain**, and J. C. Grunlan, presented at the SAMPE Regional Meeting; College Station, TX (3/30/2012).

SCHOLARSHIPS AND ACHIEVEMENTS

Texas A&M University:

- Passed Material Science and Engineering PhD Qualifiers (Fall 2011)
- Passed Material Science and Engineering PhD Preliminary Examinations (Fall 2013)

Millsaps College:

- Millsaps Presidential Scholarship
- Millsaps Tops Scholarship
- United Methodist Triple Your Dollars for Scholars
- Millsaps Methodist Youth Scholarship
- Elks Lodge Student of the Year Scholarship
- Louisiana Fraternal Order of Police Scholarship
- Hall of Fame Recipient, 2010
- Who's Who Among College Students, 2010
- Most Distinguished Woman, 2010
- Senator of the Year, 2009
- SCAC All-Sportsmanship Team, 2009
- Most Outstanding SBA Senate Committee, 2008
- All SCAC Academic Honor Roll 2006 – 2009
- Dean's List 2006 – 2009
- Asked to speak at Loyola Open House – 2008, 2010
- Speaker for 2007 Graduates
- Archie Lamb Sportsmanship Award, 2010

CAMPUS INVOLVEMENT/LEADERSHIP EXPERIENCE

SOCIETY OF PLASTICS ENGINEERS (SPE)

- BASF Plant Tour & dinner with SPE South TX, 2011
- Chemistry Open House, 2011

MILLSAPS STUDENT BODY ASSOCIATION

- Executive Director of Programming, 2009
- Executive Board Member, 2009
- Chair for Campus Services, 2007-2008
- Co-chair for Programming Committee, 2006
- Senator, 2006-2008

MILLSAPS HALL OF FAME

- Committee Member, 2007
- Who's Who Selection Committee, 2009
- Chair of Hall of Fame Committee, 2009

MILLSAPS VOLLEYBALL TEAM

- Senior and Junior Team Captain, 2008-2009
- SCAC All-Sportsmanship Team, 2009
- Defensive Specialist, 2006-2009
- SCAC Academic Honor Roll, 2006-2009

- 2nd Degree Black Belt in Tae Kwon Do

REFERENCE

Dr. Jaime C. Grunlan, Associate Professor, Department of Mechanical Engineering, Texas A&M University.
 Email: jgrunlan@tamu.edu Phone: 979-845-3027