KAYLA R. DELLE CHIAIE

kayla.dellechiaie@gmail.com

■ Education

Ph.D. in Organic Chemistry *2013 –2018*
Boston College
Chestnut Hill, MA
Advisor: Prof. Jeffery A. Byers
Thesis: "Exploration of Bis(imino)pyridine Iron Alkoxides for the Synthesis of Novel Degradable Polymers"

B. S. in Chemistry with Honors, *Cum Laude* *2009 – 2013*
Stonehill College
Easton, MA
Advisor: Prof.
Leon J. Tilley
Thesis: "Effects of Ring Size on Trifluoromethyl Directed Bridging in γ-silyl Systems"

■ Appointment

Postdoctoral Research Fellow *November 11, 2018 - Present*
University of Birmingham
Birmingham, U.K.

■ Research Experience

Postdoctoral Research Associate *November 2018 – Present*
Advisor: Prof. Andrew P. Dove
University of Birmingham
Researching novel self-assembled catalyst systems for stereoselective lactide polymerization
Developed dual-catalytic recycling of PET

Graduate Research Assistant *2013 – 2018*
Advisor: Prof. Jeffery A. Byers
Boston College
Synthesis and characterization of air-sensitive iron complexes
Developed redox-triggered and switchable polymerizations of cyclic monomers

Undergraduate Research Assistant *2011 – 2013*
Advisor: Dr. Leon J. Tilley
Stonehill College
Developed methodology to make highly strained bicyclic systems for fuel applications

■ Teaching Experience

At University of Birmingham:

Research Mentor *2018 – 2020*
Trained and advised three Master's students in research techniques
Trained two first year Ph. D. students and one visiting researcher
Mentored two graduate students
Trained four high school and undergraduate summer students
Taught one-day workshop: electron counting for transition-metal complexes

Laboratory Development
Developed a two-day undergraduate polymer recycling experiment for the School of Chemistry *Spring 2020*

At Boston College:

Teaching Assistant
Taught discussion/lab sections in the following courses: *2013-2015*
General Chemistry I (CHEM 1109) (4 sections, 1 semester) *Fall 2013*
General Chemistry II (CHEM 1110) (4 sections, 1 semester) *Spring 2014*
Organic Chemistry I (CHEM 2231) (2 sections, 1 semester) *Fall 2014*
Physical Organic Chemistry (CHEM 5535) (2 sections, 1 semester, graduate level) *Fall 2014*

Organic Chemistry II (CHEM 2232) (4 sections, 1 semester, 3 lectures) Spring 2015
Organic Chemistry Lab I (2 experiments, 12 students) *Summer 2018*

Research Mentor *2014 – 2018*
Trained three graduate students in research techniques
Trained three undergraduate students in research techniques
Taught and supervised high school students over the summer for "Paper 2 Plastics"

At Stonehill College:

Teaching Assistant *2009 – 2013*
Assisted faculty in the following lab courses:
General Chemistry I (CHM 113, 1 semester), Organic Chemistry I (CHM 221, 3 semesters)
Organic Chemistry II (CHM 222, 3 semesters), Inorganic Chemistry (CHM 244, 1 semester)

Chemistry Peer-led Team Learning (PLTL) Leader *2010 – 2013*
Conducted weekly review sessions for students (General Chemistry I, Organic Chemistry I & II)
Provided one-on-one tutoring

■ *Publications*

1) **Delle Chiaie, K. R**.; Qi, M.; Byers, J.A. "Mechanism of the Iron-catalyzed Ring-Opening Polymerization of Epoxides via a Coordination-Insertion Pathway", *in preparation*.

2) Moins, S.; Hoyas, S.; Lemaur, V.; Orhan, B.; **Delle Chiaie, K. R.**; Lazzaroni, R.; Taton, D.; Dove, A. P.; Coulembier, O. "Stereoselective ROP of *rac*- and *meso*-lactides using achiral TBD as catalyst." *Catalysts,* **2020**, 10, 620.

3) **Delle Chiaie, K. R.**; McMahon, F. R.; Williams, E. J.; Price, M. J.; Dove, A. P. "Dual-Catalytic Depolymerization of Polyethylene Terephthalate (PET)." *Polym. Chem.,* **2020**,11, 1450.

4) Weems, A. C.; **Delle Chiaie, K. R.**; Yee, R. Y.; Dove, A. P. "Selective Reactivity of Myrcene for Vat Photopolymerization 3D Printing and Postfabrication Surface Modification." *Biomacromolecules,* **2020**, 21, 163.

5) Weems, A. C.; **Delle Chiaie, K. R.**; Worch, J. C.; Stubbs, C. J.; Dove, A. P. "Terpene- and terpenoid-based polymeric resins for stereolithography 3D printing." *Polym. Chem.*, **2019**, 10, 5959.

6) Kuroishi, P. K.; **Delle Chiaie, K. R.**; Dove, A.P. "Polylactide thermosets using a bis(cyclic diester) crosslinker." *Eur. Polym. J.,* **2019**, 120, 109192.

7) Ortuño, M. A.; Dereli, B.; **Delle Chiaie, K. R.**; Biernesser, A. B.; Qi, M.; Byers, J.A.; Cramer, C.J. "The role of alkoxide initiator, spin state, and oxidation state in ring-opening polymerization of ε-caprolactone catalyzed by iron bis(imino)pyridine complexes" *Inorg. Chem.,* **2018**, 57, 2064.

8) **Delle Chiaie, K. R**.; Biernesser, A. B.; Ortuño, M. A.; Dereli, B.; Iovan, D.A.; Wilding, M.J.T.; Li, B.; Cramer, C.J.; and Byers, J.A. "The role of ligand redox non-innocence in ring-opening polymerization reactions catalysed by bis(imino)pyridine iron alkoxide complexes." *Dalton Trans.*, **2017**, 46, 12971.

9) Byers, J. A.; Biernesser, A. B.; **Delle Chiaie, K. R.**; Kaur, A.; Kehl, J. A. "Catalytic Systems for the Production of Poly(lactic acid)." *Springer*, Berlin, Heidelberg, **2017**, pp. 1–52, *book chapter*.

10) **Delle Chiaie, K. R**.; Yablon, L. M.; Biernesser, A. B.; Michalowski, G. R.; Sudyn, A. W.; Byers, J. A. "Redox-triggered crosslinking of a degradable polymer.**"** *Polym. Chem,.* **2016**, 7, 4675.

11) Biernesser, A. B.; **Delle Chiaie, K. R.**; Byers, J. A. "Block copolymerization of lactide and an epoxide facilitated by a redox switchable iron-based catalyst." *Angew. Chem. Int. Ed.,* **2016**, 55, 5251.

12) Mercadante, M. A.; Kelley, C. B.; Hamlin, T. A.; **Delle Chiaie, K. R.**; Drago, M. D.; Duffy, K. K.; Dumas, M. T.; Fager, D. C.; Glod, B. L. C.; Hansen, K. E.; Hill, C. R.; Leising, R. M.; Lynes, C. L.; MacInnis, A. E.; McGohey, M. R.; Murray, S. A.; Piquette, M. C.; Roy, S. L.; Smith, R. M.; Sullivan, K. R.; Truong, B. H.; Vailonis, K. M.; Gorbatyul, V.; Leadbeater, N. E.; Tilley, L. J.; Et. al. "1,3-γ-Silyl-elimination in electron-deficient cationic systems." *Chem. Sci.,* **2014***, 5*, 3983.

■ *Selected Presentations*

1) **Delle Chiaie, K. R.**; Dove, A. P. "Dynamic kinetic resolution polymerization of lactide." *O'Reilly and Dove Mini Symposium.* University of Birmingham, December, **2019**, poster.
2) **Delle Chiaie, K. R.**; Dove, A. P. "Chemical depolymerization of plastic waste." *AMCASH Symposium.* University of Birmingham, March, **2019**, oral presentation.
3) **Delle Chiaie, K. R.**; Qi, M.; Byers, J. A. "Mechanistic studies into iron-catalyzed epoxide polymerization reactions". *256th ACS National Meeting.* Boston, MA; August, **2018**, oral presentation.
4) **Delle Chiaie, K. R.**; Biernesser, A. B.; Byers, J. A. "Exploration of a versatile bis(imino)pyridine iron catalyst for redox-triggered cross linking Polymerization". *Polymers Gordon Research Conference.* South Hadley, MA; June, **2017**, poster.
5) **Delle Chiaie, K. R.**; Biernesser, A. B.; Yablon, L.; Sudyn, A. W.; Michalowski, G. R.; Byers, J. A. "Synthesis and characterization of crosslinked biodegradable polymers obtained using a redox-triggered crosslinking reaction". *253rd ACS National Meeting.* San Francisco, CA; April, **2017**, oral presentation.
6) **Delle Chiaie, K. R.**; Biernesser, A. B.; Byers, J. A. "Redox switchable catalysts for the synthesis of block copolymers and crosslinked polymers". *253rd ACS National Meeting.* San Francisco, CA; April, **2017**, poster, invited.
7) **Delle Chiaie, K. R.**; Biernesser, A. B.; Michalowski, G. R.; Byers, J. A. "Redox-Switchable Crosslinking Polymerization". *Boston College Graduate Student Symposium.* Dover, MA; October, **2015**, oral presentation.
8) **Delle Chiaie, K. R.**; Yablon, L. M.; Biernesser, A. B.; Byers, J. A. "Redox-switchable crosslinking polymerization". *250th ACS National Meeting.* Boston, MA; August, **2015**, poster.
9) **Delle Chiaie, K. R.**; Tilley, L. J. "Effects of Ring Size on Trifluoromethyl Directed Bridging in γ-silyl Systems". *Stonehill College Senior Theses Series.* Easton, MA; February, **2013**, oral presentation.
10) **Delle Chiaie, K. R.**; Tilley, L. J. "Trifluoromethyl Enhanced γ-silyl Elimination in the Bridging of Cyclic Systems". *243rd ACS National Meeting.* San Diego, CA; March, **2012**, poster.

■ *Selected Awards*

O'Reilly and Dove Mini Symposium "People's Choice" Best Poster Award –University of Birmingham *2019*
Donald J. White Teaching Excellence Award – Boston College *2014*

■ Outreach and Leadership

At University of Birmingham:

Guest Lecture for Stockland school STEM club (weekly) *July 2019*
Developed and oversaw month long biodegradable suture activity

Chemistry Representative for Open Day *June 2019*
Presented interactive polymer and 3D printing demonstrations

London Science Museum Chemistry Week Volunteer *April 2019*
Organized and ran all ages table with several demonstrations advertising ChemBAM research

Volunteer for St. Dunstan's Sustainable Plastics Module *March 2019*
Organized and led day long plastics module for middle school age students

At Boston College:

Graduate Mentor for Paper 2 Plastics – *Boston, MA* *2014*
Directed undergraduate leaders and high school students through five-step synthesis

Hoover Science Fair Judge *March 2014*
Judged elementary age science fair
Developed elementary age demonstration teaching catalysis and reaction rates

■ Research Skills and Attributes

Research expertise

- Organometallic/inorganic/organic synthesis
- Polymer/materials synthesis
- Ring-opening polymerization
- Switchable catalysis/polymerization
- Transition metal catalysis

- Polymer characterization
- 3D Printing material development
- Advanced inorganic/organometallic characterization

Extensive instrument experience:

- Nuclear Magnetic Resonance
- Electronic Paramagnetic Resonance
- Gas Chromatography
- Infrared Spectroscopy
- UV-Vis Spectroscopy
- Super Conduction Quantum Interference Device (SQUID) Magnetometry
- Differential Scanning Calorimetry
- Thermogravimetric Analysis
- Cyclic Voltammetry
- High Vacuum Line
- Advanced Schlenk techniques
- Advanced glovebox techniques/maintenance
- Mass spectroscopy
- Solvent purification system
- Parr Reactor
- Scanning Electron Microscopy
- Column Chromatography

- Proficient in Windows and OSX based systems, Microsoft Office, ANISOFIT, MestreNova, VNMRJ, JulX, COPASI, Kaleidagraph
- Highly effective communicator (verbal and scientific report writing)
    - Drafted several author papers
    - Gave comprehensive edits on other collaborative manuscripts
    - Significant contributor to Springer book chapter on PLA
- Ability to work both collaboratively and independently
- Efficient and creative problem solving skills
- Active participant in meetings
- Considerable knowledge of health and safety aspects of the laboratory
    - Including instrument maintenance and set-up

■ Other Work Experience

Paid internship at Arthrex Inc. Sterilization Department – Naples, FL *Summers 2012/13*

Responsible for creating new and improved clean room logs
Assembled bacterial test/control strips in a "clean box" (sterile environment)
Designed new sterilization lab and formulated SOPs for incoming instruments
Set up and trained on new Scanning Electron Microscope (SEM)

■ References

Prof. Andrew P. Dove
Postdoctoral Research Advisor
Professor of Chemistry – University of Birmingham
a.dove@bham.ac.uk

Prof. Jeffery A. Byers
Graduate Research Advisor
Associate Professor of Chemistry – Boston College
jeffery.byers@bc.edu
617-552-6725

Prof. Amir H. Hoveyda
Graduate Research Committee Member
Professor of Chemistry – Boston College
amir.hoveyda@bc.edu
617-552-3618