## KORTNEY M. MELANCON

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## EDUCATION

University of North Texas, Denton, TX Graduate Student, Ph.D. program Inorganic Chemistry Graduate Research Advisor: Dr. Thomas Cundari

Texas State University, San Marcos, TX B.Sc. Major: Chemistry Minor: Physics Undergraduate Research Advisor: Dr. Todd W. Hudnall December 2020 (expected)

May 2016

#### RESEARCH EXPERIENCE

## University of North Texas, Denton, TX

**Project:** Intramolecular bonding studies of heterobimetallic complexes containing d<sup>10</sup> metal ions: a study of metallophilicity v. covalency

- Computational investigations into structural and electronic differences for accurate descriptions of bonding character between two closed-shell metal centers; Accurate descriptions of orbital mixing by Au and Cu (n)d orbitals with (n+1)s/p orbitals generating d-s'/d-p' interatomic orbitals.
- Article published in Comments Inorg. Chem., 2018, 38 (1), 1-35.

**Project:** Computational investigations of a NHC-derived catalysts

- This research will serve as an investigation of monomeric and polymeric bithiophene- substituted NHCs as self-supported, recyclable catalysts. Both the monomeric and polymeric NHC derivatives hold promise for self-supported catalysts in benzoin condensation reactions, with the latter possessing greater advantage by integrating the NHC into the main chain of the polymer support, offering an efficient catalyst without the use of a support and a linker.
- Manuscript submitted January 2020

## Texas State University, San Marcos, TX

Project: Synthesis and spectroscopic characterization of cyclic(alkyl)(amino) carbene compounds

- Our findings led us to the discovery of the first carbene-supported chloroarsinidene as well as the first example of a stable cationic arsenic(I) species centered between two CAAC ligands.
- Article published in Chem. Eur. J., 2018, 24, 1-6.

#### TEACHING EXPERIENCE

## University of North Texas, Denton, TX

- Teaching Assistant: Laboratory course for organic chemistry I, Aug. 2018 December 2018
- Departmental Tutor: All undergraduate chemistry courses, Jan. 2018 May 2018
- Teaching Assistant: Laboratory course for organic chemistry I, Aug. 2017 Dec. 2017
- Teaching Assistant: Context of Chemistry (non-majors), June 2017 July 2017
- Teaching Assistant: Laboratory course for general chemistry I & II, Aug. 2016 May 2017

#### Texas State University, San Marcos, TX

- Undergraduate student mentor in the Hudnall Research Group, June 2014 Aug. 2016
- Teaching Assistant: Laboratory course for physical chemistry, Jan. 2016 May 2016
- Teaching Assistant: Laboratory course for organic chemistry II, June 2014 Dec. 2015
- Teaching Assistant: Laboratory course for general chemistry I, Aug. 2013 May 2014

## PUBLICATIONS

- **K.M. Melancon**, T.R. Cundari, "Computational investigations of NHC-derived catalysts for the benzoin condensation", **submitted**.
- M.N. Ericson\*, L.M. Harris\*, B. Sanders, S. Tekarli, A. Rawashdeh, R. McDougald, B.M. Otten, K.M. Melancon, O. Elbjeirami, B. McNicholas, M.A. Omary, H.B. Gray. "Metallo-organometallic Chemistry and Photophysics: The 50-electron Rule, Metalloaromaticity, and Tunable Monochrome/White Visible and Near-infrared Emission in Novel Metallocenes", manuscript in preparation. (*\*First author contribution*)
- B.M. Otten\*, K.M. Melancon\*, M.A. Omary, "All That Glitters is Not Gold: A Computational Study of Covalent vs Metallophilic Bonding in Bimetallic Complexes of d<sup>10</sup> Metal Centers," *Comments Inorg. Chem.*, 2018, 38 (1), 1-35. DOI: <u>10.1080/02603594.2018.1467315</u> (\**First author contribution*)
- K.M. Melancon, M.B. Gildner, T.W. Hudnall, "Synthesis, Spectroscopic Characterization, and Redox Reactivity of a Cyclic (Alkyl) Amino Carbene-Derived Arsamethine Cyanine Dye," *Chem. Eur. J.*, 2018, 24, 1-6. DOI: <u>10.1002/chem.201802393</u>

## SELECTED PRESENTATIONS

- K.M. Melancon, T.R. Cundari, "Computational investigations of a proposed self-supported NHC-derived polymeric catalyst" 257<sup>th</sup> ACS National Meeting & Exposition, San Diego, CA, August 2019. (Sci-Mix poster)
- K.M. Melancon, B.M. Otten, M.A. Omary, "To Be or Not To Be: d-d Bonding Studies in Heterobimetallic Complexes." 255<sup>th</sup> ACS National Meeting & Exposition, New Orleans, LA, March 2018. (oral)
- **K.M. Melancon**, B.M. Otten, M.A. Omary, "A New Bond on the Rise: d-d Bonding in Heterometallic Complexes" 50<sup>th</sup> Annual ACS Meeting-in-Miniature, Texas Christian University, Fort Worth, TX, May 2017. (oral)
- K.M. Melancon, T.W. Hudnall, "Synthesis and Characterization of Carbene-Stabilized Arsenic(I) Cations," *Gulf Coast Undergraduate Research Symposium*, Rice University, Houston, TX, October 2015. (oral)
- K.M. Melancon, A.J. Torres, T.W. Hudnall, "Synthesis and Characterization of Carbene-Stabilized Arsenic(I) Cations," 250<sup>th</sup> ACS National Meeting & Exposition, Boston, MA, August 2015. (poster)

## AWARDS / SCHOLARSHIPS

- Toulouse Graduate School Tuition Grant, University of North Texas, Denton, TX, 2019
- Toulouse Graduate School Tuition Grant, University of North Texas, Denton, TX, 2018
- College of Science Travel Grant, University of North Texas, Denton, TX, 2018
- Toulouse Graduate School Travel Grant, University of North Texas, Denton, TX, 2018
- College of Science Travel Grant, University of North Texas, Denton, TX, 2017
- Toulouse Graduate School Tuition Grant, University of North Texas, Denton, TX, 2017
- Outstanding Presentation in Inorganic Chemistry, Rice University, Houston, TX, 2015

## SKILLS / EXPERTISE

- Gaussian modeling software (ab initio and DFT methods, optimization and frequency calculations, luminescence calculations, time-dependent DFT, PES by scan calculations, and orbital analysis)
- Organic, inorganic, and organometallic synthesis
- Molecular Operating Environment software (Drug discovery, protein modeling, QM/MM, molecular dynamics, metalloenzymes and their active sites)
- Proficient in air-free synthesis using traditional Schlenk line techniques and glovebox practices
- Experienced with multi-nuclear NMR characterization (<sup>31</sup>P, <sup>19</sup>F, <sup>1</sup>H, and <sup>13</sup>C)
- Experienced with photoluminescence spectroscopy, UV/Visible absorption spectroscopy, and IR spectroscopy

## MEMBERSHIPS / POSITIONS

American Chemical Society, Active Member Division of Inorganic Chemistry, Active Member ACS Ambassador ACS Student Chapter, Texas State University, Outreach Chair ACS Student Chapter, Texas State University 2015 – Current 2015 – 2016 2013 – 2016

# SERVICE

- Undergraduate/TAMS research mentor in the Omary and Cundari Research Groups, Sept. 2016 Jan. 2019
- Laboratory & Inventory Manager in the Omary Research Group, Jan. 2017 Jan. 2019
- Undergraduate research mentor in the Hudnall Research Group, June 2014 Aug. 2016