

Manuel N. Dominguez

Materials Chemistry, UT Austin, Milliron Lab

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Education:

University of Texas at Austin August 2016 – Present

Ph.D. Candidate, Chemistry

Ph.D. Thesis: Linker Assemblies of Metal Oxide Nanocrystals and their Properties

University of South Carolina Aiken August 2012 – May 2016

B.S. Chemistry

Graduate with Honors, Cum Laude

Work History:

University of Texas at Austin August 2016 – Present

Graduate Research Assistant

University of Texas at Austin August 2016 – May 2017

Teaching Assistant, General Chemistry

University of South Carolina Aiken May 2013 – August 2013

Undergraduate Researcher

May 2014 – August 2014

May 2015 – August 2015

Military History:

United States Marine Corps, Embassy Security Group June 2008 – May 2012

Sergeant, Squad Leader, Marine Security Guard

United States Marine Corps – HMX -1 April 2004 – June 2008

Sergeant, Logistics Non-Commissioned Officer

Research Experience:

Metal Oxide Nanocrystal Surface Chemistry and Ligand Functionalization and Characterization.

University of Texas at Austin – Graduate Research

October 2017 - Present

Synthesis, Characterization, and Structural Characterization of Metal Oxide Nanocrystals and Metal Oxide NC Assemblies.

University of Texas at Austin – Graduate Research

August 2016 - Present

Synthesis and Characterization of Metal-Organic Frameworks, with a focus on Fe-MOF 525.

University of South Carolina Aiken – Undergraduate Research

August 2015 – May 2016

Electronic structure calculations on bimetallic copper compounds.

University of South Carolina Aiken – Undergraduate Research

August 2015 – Dec 2015

Cyclic Voltammetry of Fe-TACN compounds.
University of South Carolina Aiken – Undergraduate Research
August 2015 – Oct 2015

Synthesis and Characterization of Pd-NHC complexes for Suzuki cross coupling.
University of South Carolina Aiken – Undergraduate Research
September 2013 – July 2015

Teaching and Management Experience:

Career Development Chair – MRSEC SLC	May 2017 – July 2020
Hall Measurement Equipment Manager Milliron Lab	October 2018 – Present
Acid Safety and Disposal Manager Milliron Lab	July 2018 – Present
General Glovebox Manager Milliron Lab	July 2018 – Present
UV/Vis Cary Equipment Manager Milliron Lab	February 2017 – Present
Outreach Chair – Council of Graduate Chemists	May 2017 – June 2019
General Chemistry Laboratory Teaching Assistant Worked for Dr. Alisha Bohnsack	August 2016 – May 2017
NMR Student Super User / Lab Assistant University of South Carolina Aiken under Dr. Gerard Rowe	May 2014 – May 2016

Research Skills:

Nanocrystal Synthesis and Characterization, and Surface Characterization
Nanocrystal Assembly formation for Superlattices and Gels
Metal Complex Synthesis and Characterization
Organic Ligand Synthesis and Characterization
Experience and understanding of Gas Chromatography, NMR Spectroscopy, UV/Vis Spectroscopy, I.R. Spectroscopy, Small Angle X-Ray Scattering, Dynamic Light Scattering, Hall Measurement Device, X-Ray Photoelectron Spectroscopy, Scanning Transmission Electron Microscopy, Glove Box use, and spin coater use for film preparation.

Publications:

Lee, D.H; Valenzuela, V.A; Dominguez, M.N; Otsuka, M; Milliron, D.J; Anslyn, E.V. “A Self-Degradable Hydrogel Sensor for a Nerve Agent Tabun Mimic through a Self-Propagating Cascade” *Journal of the American Chemical Society*, Under Review, **2021**

Dominguez, M.N; Howard, M.P; Maier, J.M; Valenzuela, S; Sherman, Z.M; Reuther, J.F; Reimnitz, L.C; Kang, J; Cho, S.H; Gibbs, S.L; Menta, A.K; Zhaung, D.L; van der Stok, A; Kline, S.J; Anslyn, E.V; Truskett, T.M; Milliron, D.J. "Assembly of Linked Nanocrystal Colloids by Reversible Covalent Bonds" *Chemistry of Materials*, 32, **2020**: 10235 - 10245

Saez Cabezas, C.A; Sherman, Z.M; Howard, M.P; Dominguez, M.N; Cho, S.H; Ong, G.K; Green, A; Truskett, T.M; Milliron, D.J. "Universal Gelation of Metal Oxide Nanocrystals via Depletion Attractions" *Nano Letters*, 20, **2020**: 4007-4013

Ong, G.K; Saez Cabezas, C.A; Dominguez, M.N; Skjærvø, S.L; Heo, S; Milliron, D.J. "Electrochromic Niobium Oxide Nanorods" *Chemistry of Materials*, 32, **2020**: 468-475

McMoran, E.P; Dominguez, M.N; Erwin, E.M; Powell, D.R; Rowe, G.T; Yang, L. "Structural Diversity, Spectral Characterization and Computational Studies of Cu(I) Complexes with Pyridylamide Ligands." *Inorganica Chimica Acta*, 446, **2016**: 150–160.

Presentations:

Dominguez, M.N; Milliron, D.J; "Linker Induced Reversible Gelation of Colloidal Nanocrystals" Oral Presentation, NSF MRSEC Event, UT Austin, Apr. **2021**

Dominguez, M; Milliron, D; "Colloidal Nanocrystal Gels using Dynamic Covalent Chemistry" Oral Presentation, Soft Matter for All, Princeton, Oct. **2020**

Dominguez, M; Milliron, D; "Reversible Colloidal Nanocrystal Assembly using Dynamic Covalent Chemistry" Oral Presentation BEST Symposium DOW. July **2020**

Dominguez, M; Milliron, D; "Colloidal Nanocrystal Assembly using Dynamic Covalent Chemistry" Oral Presentation given at the University of Texas at Austin Graduate Seminar Series. Oct. **2019**

Dominguez, M; Saez Cabezas, C; Milliron, D; "Assembly of Colloidal Nanocrystals into Open and Functional Networks" Poster Presentation for the NSF MRSEC Annual Meeting. Jan. **2019**

Dominguez, M; Milliron, D; "ITO Nanocrystal Surface Chemistry and Assembly" Oral Presentation given at the University of Texas at Austin. July. **2018**

Dominguez, M; Rowe, G; "Synthesis and Characterization of MOF-525 with a Fe(II/III) and Mn(II/III) Metal Center." Oral Presentation given at the South Carolina Academy of Science. Apr. **2016**.

Dominguez, M; Colosimo, D; Rowe, G; "Synthesis of palladium(II)NHC-compounds and their employment as cross-coupling catalysts." Oral Presentation given at USC Aiken Research Day. Apr. **2015**.

Dominguez, M; Colosimo, D; Rowe, G; "Synthesis of palladium(II)NHC-compounds and their employment as cross-coupling catalysts." Poster Presentation given at ACS national meeting, Denver CO. Mar. **2015**.

Dominguez, M; Colosimo, D; Rowe, G; "The Identification of Optimum Pd-NHC complexes for Suzuki Cross Coupling." Poster Presentation given at USC Aiken Research Day. Apr. 2014.

Organizations:

MRSEC Student Leadership Council	2017 – 2020
Council of Graduate Chemists	2016 – 2019
American Chemical Society Scholars	2015 – Present
Marine Memorial Association	2015 – Present
American Chemical Society	2014 – Present
Tau Kappa Epsilon	2013 – 2015
USC Aiken Polo Club	2012 – 2013
USC Aiken Swim Club	2012 – 2014

Honors and Awards:

NSF Graduate Research Fellowship Recipient	May 2017 - Present
SMART Scholarship Awarded (declined)	May 2017
Dr. Bennie F. Walker Endowment Recipient	August 2016
American Chemical Society Scholars Award	August 2015
Hammer Family Scholarship Award	August 2015
Frederick Carl Memorial Scholarship Award	August 2015
Veteran's Honor Society	April 2015
USC Aiken Chemistry Ambassador	April 2015 – May 2016
USC Aiken Research Day Award	April 2015
USC Aiken Research Day Award	April 2014
Magellan Scholars Award	December 2013
Dean's List	December 2012 – May 2016