Nicholas M. Randell

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Academic Background

Doctor of Philosophy (Chemistry)

University of Saskatchewan, Saskatoon, SK 2012-2017

- Supervisor: Dr. T.L. Kelly
  - Thesis Title: Tuning the Properties of Isoindigo-Based Organic Semiconductors Through Structural Engineering

Bachelor of Science – Honours (Chemistry)

Memorial University of Newfoundland, St. John's, NL 2008-2012

- Major: Chemistry, Minor: Mathematics
- Honours Supervisors: Dr. L.K. Thompson, Dr L.N. Dawe
  - Thesis Title: Self-assembled Poly-Nuclear Coordination Complexes; A Structural and Magnetic Study

Research Experience

Post-Doctoral Researcher – Department of Chemistry

University of Calgary August 2019-Present

- Solution processing of metal-oxide interlayers in light emitting diodes
- Fabrication and testing of light emitting diodes with new charge-transport layers
- Supervisor: Dr. Simon Trudel

Post-Doctoral Researcher – SolHyCat Group

LCBM, CEA Grenoble February 2018-July 2019

- Synthesis and characterization of transition metal photosensitizers
- Determination and study of photo-redox processes
- Supervisors: Dr. Vincent Artero, Dr. Murielle Chavarot-Kerlidou

PhD Candidate – Department of Chemistry

University of Saskatchewan September 2012- November 2017

- Synthesis and characterization of isoindigo-based organic semiconductors
- Fabrication, testing, and optimization of thin film organic solar cell devices
- Supervisor: Dr. Timothy L. Kelly

NSERC USRA Research Assistant – Department of Chemistry
Memorial University of Newfoundland May 2012- August 2012
- Synthesis of Ln_4 supramolecular coordination complexes
- Determination of magnetic properties
- Supervisors: Dr. Laurence K. Thompson

BSc. Honours Candidate – Department of Chemistry
Memorial University of Newfoundland September 2011- May 2012
- Synthesis of supramolecular transition metal complexes
- Single crystal x-ray structure solution
- Supervisors: Dr. Laurence K. Thompson, Dr. Louise N. Dawe

NSERC USRA Research Assistant – Département de Chimie
Université de Montréal May 2011-August 2011
- Synthesis of Rhenium-tetrazine chromophores
- Photocatalytic production of $H_{2(g)}$
- Supervisor: Dr. Garry S. Hanan

NSERC USRA Research Assistant – Department of Chemistry
Memorial University of Newfoundland May 2010- August 2010
- Gas phase analysis of transition metal-uracil complexes
- DFT calculations of complex fragmentation reactions
- Supervisor: Dr. Travis D. Fridgen

Peer Reviewed Journal Articles

1. **N.M. Randell**, J. Rendon, M. Demeunynck, P.-A. Bayle, S. Gambarelli, V. Artero, J.-M. Mouesca, M. Chavarot-Kerlidou; Tuning the Electron Storage Potential of a Charge-Photoaccumulating Ru(II) Complex by a DFT-Guided Approach, *Chem. Eur. J.*, **2019**, 25, 13911-13920 DOI: 10.1002/chem.201902312

2. **N.M. Randell**, T.L. Kelly; Recent Advances in Isoindigo-Inspired Organic Semiconductors, *Chem. Rec.,* **2018**, 19, 973-988, DOI: 10.1002/tcr.201800135

3. C.L. Radford, A.D. Hendsbee, M. Abdelsamie, **N.M. Randell,** Y. Li, M.F. Toney, T.L. Kelly; Effect of Molecular Shape on the Properties of Non-Fullerene Acceptors: Contrasting Calamitic Versus 3D Design Principles, *ACS Appl. Energy Mater.,* **2018**, 1, 6513-6523 DOI: 10.1021/acsaem.8b01433

4. **N.M. Randell,** C.L. Radford, J. Yang, J. Quinn, D. Hou, Y. Li, T.L. Kelly; Effect of Acceptor Unit Length and Planarity on the Optoelectronic Properties of Isoindigo-Thiophene Donor-Acceptor Polymers, *Chem. Mater.,* **2018,** 30**,** 4864-4873 DOI: 10.1021/acs.chemmater.8b02535

5. **N.M. Randell**, K.F. Fransishyn, T.L. Kelly; Lewis Acid-Base Chemistry of 7-Azaisoindigo-Based Organic Semiconductors, *ACS Appl. Mater. Interfaces* **2017**, 9, 24788-24796, DOI: 10.1021/acsami.7b06335

6. **N.M. Randell**, P.C. Boutin, T.L. Kelly; Bisisoindigo: Using a Ring-Fusion Approach to Extend the Conjugation Length of Isoindigo, *J. Mater. Chem. A*, **2016**, 4, 6940-6945, DOI: 10.1039/C5TA07511D

7. **N.M. Randell**, A.F. Douglas, T.L. Kelly; 7-Azaisoindigo as a New Electron Deficient Component of Small Molecule Chromophores for Organic Solar Cells, *J. Mater. Chem. A*, **2014**, 2, 1085-1092, DOI: 10.1039/c3ta14263a

8. **N.M. Randell,** M.U. Anwar, M.W. Drover, L.N. Dawe, L.K. Thompson; Self-Assembled $Ln(III)_4$ (Ln = Eu, Gd, Dy, Ho, Yb) [2 × 2] Square Grids: a New Class of Lanthanide Cluster, *Inorg. Chem.,* **2013,** 52, 6731-6742, DOI: 10.1021/ic4008813

9. **N. M. Randell**, L.K. Thompson, L.N. Dawe; 6,6'-Dimethoxy-2,2'-{[(*E*,*E*)-hydrazine-1,2-diylidene]bis(methanylylidene)}diphenol Methanol Disolvate. *Acta Cryst.*, **2012**, E68, o2711, DOI: 10.1107/S1600536812034940

10. O. Y. Ali, **N. M. Randell**, and T. D. Fridgen; Primary Fragmentation Pathways of Gas Phase $[M(Uracil\text{-}H)(Uracil)]^+$ Complexes (M=Zn, Cu, Ni, Co, Fe, Mn, Cd, Pd , Mg, Ca, Sr, Ba, and Pb): Loss of Uracil versus HNCO. *Chem. Phys. Chem.,* **2012,** 13, 1507-1513. DOI: 10.1002/cphc.201200015

Conference Presentations

1. **102nd Canadian Chemistry Conference and Exhibition**
   Quebec City, PQ June 3 - June 7, 2019
   Oral Presentation - The Design and Synthesis of Charge Accumulating Ru(II) Photosensitizers for Multi-Electron Photocatalytic Solar Fuel Production

2. **101st Canadian Chemistry Conference and Exhibition**
   Edmonton, AB May 27 - May 31, 2018
   Invited Oral Presentation - Altering the Orbital Energies of Isoindigo-Inspired Semiconductors by Synthetic Design

3. **100th Canadian Chemistry Conference and Exhibition**
   Toronto, ON May 28-June 1, 2017
   Oral Presentation - The Effects of the Ratio of Donor to Acceptor in Isoindigo-Inspired Organic Semiconductors

4. **Functional π Conjugated Materials 12**
   Seattle, WA July 19 - July 24, 2015
   Poster Presentation - Bisisoindigo: a Highly Planar n-Type Semiconductor

5. **97th Canadian Chemistry Conference and Exhibition**
   Vancouver, BC June 1- June 5, 2014
   Oral Presentation - 7-Azaisoindigo as a Building block for Functional π-Conjugated Organic Materials

6. **Symposium Annuel de Chimie Inorganique du Québec**
   La Mauricie National Park, PQ Aug 22-Aug 23, 2011
   Oral presentation - Rhenium(I) Chromophores Based on 3,6-Pyridyl-1,2,4,5-Tetrazine Ligands

7. **Inorganic Chemistry Exchange Summer Workshop**
   Montreal, PQ Aug 18-Aug 19, 2011
   Oral presentation - Rhenium(I) Chromophores Based on 3,6-Pyridyl-1,2,4,5-Tetrazine Ligands

8. **94th Canadian Chemistry Conference and Exhibition**
   Montreal, PQ June 5- June 9, 2011
   Poster Presentation - Structures and Fragmentation of Gas Phase $[M(Ura-H)(Ura)]^+$ Complexes (M = Zn^{2+}, Cu^{2+}, Ni^{2+}, Co^{2+}, Fe^{2+}, Mn^{2+}, Cd^{2+}, Pd^{2+}, Mg^{2+}, Ca^{2+}, Ba^{2+}, and Pb^{2+}

Awards and Honours

NSERC Postdoctoral Fellowship 2020-2022
University of Calgary

Gerhard Herzberg Thesis Acceleration Award 2016-2017
University of Saskatchewan

NSERC Alexander Graham Bell Canada Graduate Scholarship –D3 2013-2016
University of Saskatchewan

Gerhard Herzberg Memorial Scholarship 2012-2016
University of Saskatchewan

College of Graduate Studies Tuition Scholarship 2012-2016
University of Saskatchewan

Saskatchewan Innovation and Opportunity Award 2012
University of Saskatchewan

NSERC Alexander Graham Bell Canada Graduate Scholarship –M 2012-2013
University of Saskatchewan

NSERC Undergraduate Student Research Award 2012
Memorial University of Newfoundland

NSERC Undergraduate Student Research Award 2011
Université de Montréal

Inorganic Chemistry Exchange Summer Student Internship 2011
Université de Montréal

Undergraduate Poster Physical/Theoretical Chemistry - 2nd Place 2011
94th Canadian Chemistry Conference and Exhibition Montreal

NSERC Undergraduate Student Research Award 2010
Memorial University of Newfoundland

Teaching Experience

Guest Lecturer – University of Calgary
Calgary, AB January 2020
Nanoscience Program
- Duties included:
  - Presented guest lecture in Nanoscience 401 on shape control in nanoparticle synthesis

Undergraduate Mentor – University of Saskatchewan
Saskatoon, SK September 2013- August 2016
Kelly research group, Department of Chemistry
- Duties included:
  - Supervision of one fall semester undergraduate research volunteer, one Inorganic Chemistry Exchange summer researcher and one undergraduate honours student

Introductory Chemistry Demonstrator – University of Saskatchewan
Saskatoon, SK January 2014- April 2016
Department of Chemistry
- Duties included:
  - Experimental demonstrations of core curriculum concepts in introductory chemistry lectures

Assistant Teaching Lab Demonstrator – Memorial University of Newfoundland
St. John's, NL September 2009- May 2012
Department of Chemistry
- Duties included:
  - Instruction of laboratory experiments to 1st year students
  - Demonstration of laboratory techniques
  - Correcting of completed laboratory reports

Committee and Volunteer Service

NSERC Undergraduate Student Research Award adjudication committee 2016

NSERC CGS-M Award adjudication committee 2016

Treasurer, Chemistry Course Council (chemistry graduate student society) 2013