RICHARD B. (BEN) CANTY

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EDUCATION

Massachusetts Institute of Technology Chemical Engineering Department, Cambridge, MA

PhD Candidate **Current**

Integrating autonomous high-throughput experimentation with machine learning models. Mechanistic predictions of dye degradation due to heat, oxidation, and light.

University of Virginia School of Engineering and Applied Sciences, Charlottesville, VA

B.S. in Chemical Engineering (GPA 3.91/4.00) **2018**

Studying the fundamentals of chemical engineering with a focus on unit operations, system design, heat and mass transport, and chemistry. Additionally, studying computer modeling and simulation as well as large data management.

Northview High School, Johns Creek, GA

High School Diploma **2014**

Honors: Summa cum Laude (Top 2% of class)

AWARDS

UCEM Sloan Scholarship (Cohort 4)	2018-2023
Thomson Scholarship	May 2017
Intermediate Honors	Nov 2017
Bechtel Science and Engineering Scholarship	May 2014
Eagle Scout Award	July 2011

RESEARCH EXPERIENCE

Jensen Group, Cambridge, MA

Graduate Researcher **Jan 2019 – Present**

- Designing, constructing, and testing a high-throughput experimental platform for the autonomous synthesis and characterization of dyes.
- Designing software control of said apparatus for integration with active learning algorithms.
- Developing advanced machine learning models which explain their solutions.

Román Group, Cambridge, MA

Research Affiliate **Jun 2017 – Aug 2017**

- Designed and executed catalysis research on the upgrading of lignin bio-oils using cobalt oxide catalysts in batch reactions.
- Interpreted and analyzed chromatography, mass spectroscopy, and powder x-ray diffractometry data to improve valorization of lignin bio-oil and model compounds.
- Presented the results of the research via a poster presentation in a public forum.

Robin A Felder Research Laboratory, Charlottesville, VA

Automatization Intern **May 2016 – Aug 2016**

- Programed assays on micropipetting machines
- Programmed an Arduino-pH probe interface
- Maintained numerous mechanical systems
- Designed and built equipment, and created laboratory supplies on a 3D printer.

Solvay Specialty Polymers, Atlanta, GA

Summer Intern **Jun 2015 – Aug 2015**

- Conducted an experiment to investigate sulfur corrosion in the pilot plant and to identify optimal replacement parts.

WORK EXPERIENCE

NREL, Golden, CO

Researcher (Part of the MIT Sloan School of Engineering Practice) **Jan 2020 – Mar 2020**

- Designed novel measurement apparatus for flame speed and modeled biopolymer processes for cradle-to-gate technoeconomic analysis.

University of Virginia, Charlottesville, VA

Class Grader **Aug 2017 – Dec 2017**

- Graded and provided feedback on thermodynamic and unit operations homework assignments.

Solvay Specialty Polymers, Atlanta, GA

Summer Intern **Jun 2015 – Aug 2015**

- Prepared and performed gas and liquid chromatography tests for experimental polymers and for quality control
- Measured, prepared, and performed IZOD, tensile, and flexure tests to determine physical properties of novel polymers

The Drake House, Roswell, GA

Volunteer **2013-2014**

Sorted and organized in-kind donations, and stocked the food pantry for a shelter for homeless mothers and their dependent children

The Red Tie Productions, Johns Creek, GA

Musical Director **2011-2014**

Composed and produced musical scores for entries in film competitions

PUBLICATIONS/PRESENTATIONS

Ben Canty (Presenter), Eric Anderson, Michael Stone, Dr. Yuriy Román-Leshkov, (2017, August). *Catalytic Upgrading of Lignin Oil Using Cobalt Oxides by Dealkylation and HDO*. Poster presented at the Summer Scholars Poster Session, Cambridge, MA.

- Summarized research conducted during the MIT Materials Processing Center and the Center for Materials Science and Engineering Summer Scholars REU.
- Presented reaction pathways for model compounds on Co oxide catalysts as in relation to reagent chemistry and reactor conditions.
- Gave catalyst evolutions for reactions and demonstrated yields and selectivities of target compounds
- Demonstrated a proof of concept using lignin oil which exhibited HDO and dealkylation.

SKILLS

Advanced in Python, Java, C, Matlab, and C++ programming
ELA 901 Safety and Chemical Engineering Education (SAChE) Certified
Proficient in Microsoft Office Suites
Competent in CAD design software

LANGUAGES

English – Native speaker
Spanish – Able to read and write with basic competence

MEMBERSHIPS

American Institute of Chemical Engineers
National Society of Collegiate Scholars