



# Kathryn E. Knowles

**Graduate Institution:** Northwestern University

**Graduate Discipline:** Chemistry

**Hometown:** Rochester, NY

**Relevant SC Research:** Basic Energy Sciences

## Research Interest:

I am interested in the influence of surface chemistry on the behavior of photo- or electrochemically generated charge carriers in colloidal semiconductor quantum dots. Quantum dots are attractive materials for photovoltaic and photocatalytic applications due to their tunable electronic structures, their solution processability, and their capacity to generate multiple excitons upon absorption of a single photon; however, optimal incorporation of QDs into such systems requires a fundamental understanding of their surface chemistry and how to control it. The goal of my research is to learn how varying the structural and electronic properties of surface ligands influences the behavior of photoexcited or electrochemically injected charge carriers in QDs. I am particularly interested in studying the influence of surface chemistry on the mechanisms of photoinduced charge transfer between QDs and molecular redox partners.

## About Me:

I received bachelor's degrees in chemistry (B.S.) and mathematics (B.A.) from the University of Rochester in 2008, where I completed undergraduate research in the design of multi-component homogeneous systems for the photoinduced reduction of water. I started graduate studies in chemistry at Northwestern University in the fall of 2008, and I am currently a fourth-year

graduate student in Prof. Emily Weiss's research group. In addition to working on my own research, I also enjoy serving as a mentor for a first-year graduate student and participating in scientific outreach programs for middle and high school students.

I hope to complete and defend my thesis next summer and start a post-doctoral position in the fall of 2013. My ultimate career goal is to become a professor at an academic research institution where I can teach both undergraduate and graduate students and establish my own research group.

Outside of lab I enjoy playing intramural soccer and flag football, running, cooking, and reading.



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