

# Alexandra Harrison Brozena

**Graduate Institution:** University of Maryland College Park

**Graduate Discipline:** Materials Chemistry

**Hometown:** Lothian, MD

**Relevant SC Research:** Basic Energy Sciences



## Research Interest:

I am interested in carbon nanomaterials for energy applications. Specifically, I study the mechanisms of organic reactions on single-walled, double-walled and multi-walled carbon nanotubes in order to better understand how we can exploit these materials for applications such as lithium ion batteries, solar cells, and thin film electronics. Carbon nanotubes by themselves are fundamentally interesting, but without chemical manipulation and separation of these highly diverse materials, they are of little use to the energy community. Covalent functionalization is one method in particular to tailor these materials for our needs, but despite extensive research in the carbon nanotube field over the last twenty years, little attention has been given to understand some of the most basic chemistries that occur in these unique one-dimensional systems. Understanding the mechanisms of covalent functionalization allow us to control the structure and properties of these materials in a superior manner. I am also involved in a multi-university collaboration to study our functionalized carbon nanotubes as potential materials for lithium ion battery anodes.

## About Me:

I am actively involved in the Department of Energy's Energy Frontier Research Center (EFRC) collaborative program. The University of Maryland

flagships this Nanostructures for Electrical Energy Storage (NEES) EFRC, but we are actively involved with other universities and labs as well in our efforts to study and produce new nanomaterials for improved lithium ion battery technology. Professionally, I wish to continue in the energy nanomaterials field in a government laboratory or industrial context. I am also a member of the American Chemical Society, Organic division.

Outside of my professional interests, I devote time to training for long distance races. I also try to find time to play the piano and am attempting to learn the guitar.



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