



Anion switcheroo: Transformation of metal sulfides into selenides and tellurides

Kate Plass

Professor, Department of Chemistry
Franklin & Marshall College
Pronouns: she/her or them/they

Research site:

<https://sites.google.com/fandm.edu/plasslab>

Abstract

Anion exchange chemistry is widely used to alter the properties of perovskites and to transform metal and metal oxide nanomaterials, but despite its promise as a means of creating new 2D and 3D-metal chalcogenide nanomaterials it has not been widely applied outside of these systems. We have discovered anion exchange chemistry that changes copper sulfide nanorods into copper selenide or telluride without disturbing the anion sublattice or morphology of the particle. The commonly observed Kirkendall effect, where anion exchange leaves central voids, does not occur. This talk will show how these transformations proceed through regioselective partial exchanges and identify the crucial chemical species driving the exchange. In addition to this experimental work, the nanobots Early College Research Program trains first and second year chemistry students to simulate these systems through modeling of solution, surface, and bulk interactions using the ReaxFF reactive force-field approach.