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Major: Chemistry
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Funding Source: National Science Foundation(Department of Materials Research)

Water Splitting by Mixed Chalcogenide Catalysts

The depleting supply of fossil fuels has led to deeper investigation of water-splitting as a sustainable energy source. Specifically, using transition metal chalcogenides to catalyze the water-splitting reaction through oxygen and hydrogen evolution reactions. While the decreasing electronegativity of the chalcogenide group increases their activity, it also decreases their stability, leading to the investigation of mixed anion chalcogenides in order to keep both the stability and activity high. This research will further the understanding and efficiency of water-splitting for energy storage and inspire more research in the future. In these experiments, cobalt telluroselenide (Cox-Tey-Sez) and nickel telluroselenide (Nix-Tey-Sez) catalysts were created and their oxygen evolution activity and stability were recorded, and it was observed that the catalytic activity of the telluroselenides was higher than the selenide, but lower than the telluride by itself, because of the increase in anion electronegativity which decreased its catalytic activity.

Isabella Feltenstein is a sophomore at Missouri S&T majoring in Chemistry with a Biochemistry emphasis. Her interest in research began when she received her first microscope as a young girl, and has progressed from there. On campus, she is a member of Chi Omega sorority, networking chair of the Society of Women Engineers, and runs varsity cross country and track for the miners. In her free time, she enjoys reading, running, and hanging out with friends and family.