

JESSICA JOHNSON, LINDSEY LANEVE, ASHLEY RUZA, ERICA HARVEY, Dept. of Natural Sciences, Fairmont State University, Fairmont, WV, 26554. SHArK and SEAL investigations of mixed metal oxides with photoelectrocatalytic potential.

The goal of our research is to find a way to help sunlight separate water into hydrogen and oxygen gases, so hydrogen can be used as a source of energy even when the sun is not shining. Though the water-splitting process occurs naturally, it is very slow. The Solar Army, a nationwide group of researchers, is searching for a safe, inexpensive photoelectrocatalyst, a substance that can speed up the sunlight-driven water splitting reaction. Instruments known as SHArK (Solar Hydrogen Activity research Kit) and SEAL (Solar Energy Activity Lab) were used to test samples containing different ratios and combinations of earth-abundant metal oxides. Ratios and metal oxides were chosen based on previously made samples containing promising results. SHArK and SEAL both test in different ways for photocurrent, an electric current activated by light. Metal oxide samples that produce substantial photocurrent could potentially be developed as photoelectrocatalysts and help the future of the planet. Our research efforts explored oxide combinations of copper, cobalt, and nickel, and of strontium, chromium, and iron. The ratios of copper, cobalt, and nickel have given null results, while the ratios of strontium, chromium, and iron have continued with positive results.