Hydrogen Generation from Water Disassociation Using Small Currents and Harmonics

Trien N. Nguyen[1]
[1]Department of Physics, Purdue School of Science

Hydrogen can be produced cheaply and efficiently from water sources using a combination of harmonics and small currents. Hydrogen is a clean and virtually inexhaustible fuel source with applications ranging from the basic combustion engine to more advanced fuel cells. The major stumbling block to hydrogen adoption is the difficulty in generation and transportation. To study these issues, a prototype hydrogen generator was created using readily available designs and materials and its hydrogen generation rates were tested by varying the gap between the cathode and anode, frequencies used in water dissociation, and voltages applied to the purified water. Since purified water and small currents are used, hydrolysis is not the driving force behind the dissociation of the water molecules. The cause of the water dissociation is the weakening effect the harmonic frequencies have on the hydrogen-oxygen bonding. The expectation is that voltage, cathode and anode surface area will have minimal effects on hydrogen production rates. Narrowing the frequency range that produces optimal water dissociation may increase hydrogen generation rates. Other experiments show that decreasing the gap between the cathode and anode may also increase hydrogen production. By increasing hydrogen production rates beyond the limits imposed by hydrolysis, the possibility exists of creating a hydrogen-on-demand system that eliminates the need to produce, store, and transport hydrogen.

Mentors: David Goodman, Department of Engineering Technology, Purdue School of Engineering and Technology, IUPUI; Horia Petrache, Department of Physics, Purdue School of Science, IUPUI