Generating Hydrogen and Oxygen to Power an Internal Combustion Engine as a Function of Dry Cells and Amperage

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Petroleum-based engines use carbon-based non-renewable energy sources, and electric options have low range and slow refuel speeds. A oxyhydrogen (HHO) gas wet cell system was designed, engineered, and powered with standard batteries to produce hydrogen and oxygen for a marine engine. Advantages of oxyhydrogen include a good energy/weight ratio, but poor energy/volume ratio (6, 10). Skipping the energy expense of compression and storage as done in this experiment was performed to address this drawback. Optimal electrolyte mixtures were determined earlier to be 1 molar KOH electrolyte solution and produced 1.9l/min at 18 volts. This year, a different modified engine more than twice the previous size and running at three times the rpm was used and it was calculated to need 12/lpm of HHO. This application worked to convert a 200cc internal combustion engine to Hydrogen gas in excess 17.7/lpm in excess of the stated engineering goal of 12.3/lpm. Real world applications such as the Energy Observer, demonstrate real world promise for sustainable Hydrogen energy.

Awards Won:
Air Force Research Laboratory on behalf of the United States Air Force: Glass trophy and USAF medal for each recipient
Air Force Research Laboratory on behalf of the United States Air Force: First Award of $750 in each Regeneron ISEF Category, FOR 2023 ONLY: EBED WILL HAVE TWO