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Healing Air Pollution with Hydrogen

The purpose of this experiment was to discover if introducing hydrogen and oxygen into the intake of a small engine would reduce gasoline consumption and pollutants such as carbon dioxide (CO2), volatile organic compounds (VOCs), and ozone. It was hypothesized that CO2, VOCs, and amount of gasoline consumed will decrease because hydrogen will burn and supplement some fuel that regularly would not ignite. Ozone was hypothesized to increase due to high combustion temperatures. The emissions of an unmodified small engine were measured with an air quality monitoring instrument. In the experimental trials, the engine was modified to run on supplemental hydrogen and oxygen, produced through a homemade electrolysis apparatus. Throughout the experiment, the carburetor was adjusted in order to keep revolutions per minute (rpm) constant. Multiple trials were performed to increase data accuracy and reduce error. The data supported some of the hypothesis. CO2 decreased by 13.855%. Light VOCs decreased by 8.086%. However, heavy VOCs increased by 5.122% and gasoline consumption increased by 5.783%. Ozone experienced no change. These findings suggest that engines modified to run on hydrogen-hybrid fuels have the potential to reduce CO2 and light VOC emissions. However, the same could not be confirmed about the gas consumption and heavy VOCs. This experiment provides data to support the claim that homemade hydrogen-hybrid technology can be a cheap, readily available, renewable resource to help reduce a small portion of vehicle emissions globally.