Alternative Fuel Vehicles: Hydrogen as a Viable Option

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Human civilization needs environmentally friendly, low cost energy alternatives. Hydrogen was discovered as a great source of energy because it generates electricity by reacting with Oxygen and the only byproduct produced is water. However, Hydrogen is not available in nature and its production requires the use of more electrical energy. Can hydrogen be a viable source of energy and less expensive than gas to move automobiles ? The experiment simulated Hydrogen production via hydrolysis and then reversal of the process using Hydrogen and Oxygen to produce water and generate electricity. The energy required for electrolysis was compared to the energy produced by the reverse cycle and the efficiency was determined. The results showed consumption of 17.7 Joules to produce one ml of H2. The reverse cycle generated 3.1 Joules per ml of H2. The efficiency was 18%. Additional research was done for the economic analysis, comparing alternatives to move a car 25 miles. With gas, the consumption is one gallon at a cost of US$ 2.50 . With electricity from photovoltaic panels, the cost is US$ 8.04. With hydroelectric energy, the cost is US$ 5.23. By using the PEM Cell efficiency determined, the conclusion is that Hydrogen is still not an economically viable option, as its cost is higher than conventional fossil fuel (gas). However, additional research shows that industrial PEM Cells have higher efficiency (70%) than the one determined in this experiment. That being considered, the conclusion would change and prove that Hydrogen is already a viable energy source.

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