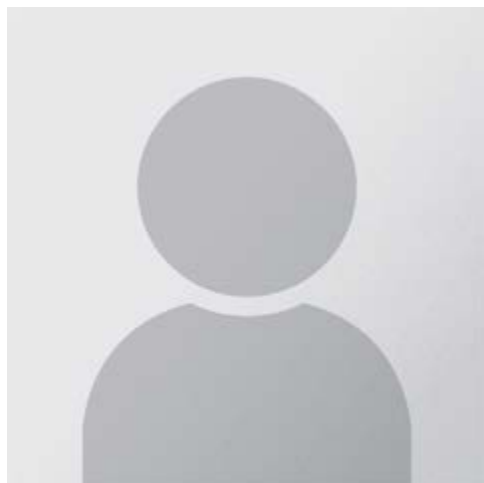


2003 State NMJAS Paper Competition Winner

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A Study on Practical Production of Hydrogen Through Efficient Electrolysis

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Abstract: This experiment's purpose was to see which of the many variables of electrolysis are significant factors to electrical efficiency and under what conditions electrolysis is most efficient. Hydrogen gas was collected off the cathode and measured in moles. By knowing the specific energy per mass ratio of hydrogen and dividing it by the total energy input into the experiment through electricity, electrical efficiency was found. The driving factors of electrolysis were found to be pressure and salt concentration. The optimum conditions for efficient electrolysis are a salt concentration of 0.0672 molar, ambient pressure of 1×10^5 Pascals, and a water temperature of 295 Kelvin. At this point the predicted efficiency is 92%, which means that 92% of the energy inputted into electrolysis can be stored by the hydrogen produced. Some further studies on this question would include: what happens at higher salt concentrations and could this information be applied to a small garage-sized device that could produce cheap hydrogen through Photovoltaic solar panels?