



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> <b>Cody J. Wolfberg</b>	<b>Project Number</b> <b>J0538</b>
<b>Project Title</b> <b>pH Meets Electrolysis: The Test</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective of this project is to find out how pH affects the process of electrolysis. The experiment was performed to determine which pH level of an electrolyte (sulfuric acid) would electrolyze most efficiently. This efficiency was determined by how much hydrogen and oxygen gas was produced in a ten minute period. <b>Methods/Materials</b> First, distilled water and the electrolyte (sulfuric acid) were mixed until the mixture obtained a pH level of 2. The mixture was poured into the Hoffman Electrolysis Apparatus and the power source was turned on for 10 minutes. Afterwards, the hydrogen and oxygen that the apparatus captured was measured and recorded. A second trial was performed at the same pH level to ensure accuracy. The procedure was repeated with pH levels of 4 and 6. <b>Results</b> The mixture with a pH of 2 electrolyzed more efficiently than the other pH levels. The electrolysis process of the electrolyte with a pH level of 2 resulted in an average of 1.2 mL of hydrogen and .085 mL of oxygen produced after electrolyzing for 10 minutes. Each succeeding trial had a higher pH level and a lower concentration of sulfuric acid. The amount of hydrogen and oxygen produced during electrolysis decreased as the pH approached 6. At a pH level of 6, 0.05 mL of oxygen was produced and 0.05 mL of hydrogen was produced. <b>Conclusions/Discussion</b> In conclusion, an electrolyte with a pH level of 2 electrolyzes more efficiently than higher pH levels. The hypothesis proved incorrect. Lower pH levels do in fact increase the efficiency of the Hoffman Apparatus in separating the solution into hydrogen and oxygen gas. This can be applied to the future use of hydrogen gas as an important energy source.	
<b>Summary Statement</b> This experiment shows that the pH level of an electrolyte affects the rate of electrolysis.	
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