California Science Center

CALIFORNIA STATE SCIENCE FAIR
2001 PROJECT SUMMARY

Your Name (List all student names if multiple authors.)
Aaron C. Jones

Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9)
Martian Survival: The Chemistry of Oxygen Extraction

Science Fair Use Only

J0417

Division
X **Junior (6-8)** _ **Senior (9-12)**

Preferred Category (See page 5 for descriptions.)
5 - Earth Sciences/ Planetary Sciences/ Physical Environments

Abstract (Include Objective, Methods, Results, Conclusion. See samples on page 14.)
Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.

I am using two processes of oxygen extraction which are electrolysis of water and destructive distillation of rocks. The purpose of my project is to create a solution to the lack of oxygen on Mars so that we can send humans to Mars or Space in general.
Methodology: In my project I am generating oxygen by electrolysis of water and destructive distillation of rocks. For the electrolysis process the power generator was set at 7.5 volts for 30 minutes. For the destructive distillation I used 10 grams of rock for each test and the oxygen extraction time was 30 minutes. The experimental variable was method of oxygen extraction and my dependent variable was amount of oxygen produced per unit of time. Each process was repeated three times. In destructive distillation I heated the rocks to produce oxygen. In electrolysis I used electrical currents to separate the water.
Results: The average of the three tests for the electrolysis was 28.66666667mL. The average amount of oxygen for destructive distillation was 20.16666667mL. The results were all measured in milliliters. The three tests for electrolysis showed 30mL for test 1, 29mL for test 2, and 27mL for test 3. The three tests for destructive distillation showed 17mL for test 1, 22.5mL for test 2, and 21mL for test 3.
Conclusion: The original hypothesis was "The extraction of oxygen from Martian-like rocks and soil through destructive distillation will generate more oxygen than electrolysis of water." My hypothesis was rejected because the results show that electrolysis of water produced more oxygen than destructive distillation. The results that showed the rejection were the numbers of milliliters from each of the three tests and their averages.
Further Research: Some questions that were raised from my project were: "Does the type of rock matter for destructive distillation?" and "Will different periods of time for extraction cause a change in the results?" With those questions I think I could take my project to the next level by using different rocks and grinding them even finer. I could also do different periods of time for extraction.

Summary Statement (In one sentence, state what your project is about.)
My project is to find the quickest and most efficient way to generate oxygen with Martian like materials.

Help Received in Doing Project (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4.