California Science Center

CALIFORNIA STATE SCIENCE FAIR
2001 PROJECT SUMMARY

Your Name (List all student names if multiple authors.)
Michael F Mennis

Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9)
Liquid Battery

Science Fair Use Only

J0423

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

Preferred Category (See page 5 for descriptions.)
4 - Chemistry

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.

Objective: The objective of my project was to find the effect of salt and heat on the amount of current produced by a chemical reaction in three liquids.

Materials and Method: The three liquids I used were: homogenized whole milk (a base); lemon juice (an acid); and distilled water (a neutral liquid). My procedure was to place two alligator clips, one holding an anode and one holding a cathode, in each of the three liquids for ten seconds. The alligator clips were each connected to a copper wire connected into a digital multimeter that measured the amount of current produced by the chemical reaction. The anode was a ten centimeter long piece of magnesium ribbon, and the cathode was two copper pennies. I tested each liquid under the following conditions: plain at room temperature; with 50mL of salt added; heated to 53°C; and with 50mL of salt added and heated to 53°C.

Results: My results showed that lemon juice plain produced more current than any other plain liquid. When salt was added there was a stronger current then a plain liquid. A heated liquid also produced more current than a plain liquid. A heated liquid with salt produced more current than a liquid with heat only or salt only.

Conclusion: I concluded that because lemon juice is an acid it reacts the most with alkaline metals like magnesium and copper. Salt, an electrolyte, increases the conductivity of the liquid. Heat, a catalyst, amplifies and speeds up the chemical reaction. Therefore lemon juice with 50mL of salt and heated to 53°C produced the most current.

Summary Statement (In one sentence, state what your project is about.)
My project was to find the effect of salt and heat on the amount of current produced by a chemical reaction in three liquids.

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.
My mother held the electrodes.