



# CALIFORNIA STATE SCIENCE FAIR

## 2003 PROJECT SUMMARY

Name(s)

Tammy N. Ziembra

Project Number

**S0526**

Project Title

### The Effect of Different Ratios and Combinations of Solutions on Temperature Change and Evaporation Rate

#### Abstract

#### Objectives/Goals

Problem: The point of this experiment was to determine the effect of different ratios and combinations of water to Methanol to Ethanol to Acetone to Propanol solutions on temperature change and evaporation rate.

Hypothesis: I hypothesized that the smaller the molar mass of a liquid solution, the greater the temperature change it will have and the faster it will evaporate.

#### Methods/Materials

Materials: The materials needed are a computer, data Studio 1.6 program, USB link and temperature sensor, water, Methanol, Ethanol, Acetone, Propanol, test tube and beaker, graduated cylinder and funnel, and filter paper.

Methods:

# Labeled the test tubes.

# Made up each solution (10mL each) by using the solution ratios.

# Took 2.5 cm X 2.5 cm piece of filter paper and covered the temperature sensor. Used a rubber band to secure the paper.

# Put the temperature probe with filter paper into the test tube containing a solution.

# Pressed "start" on Data Studio 1.6 and recorded for 4 minutes & 15 seconds.

# Recorded the final temperature

#### Results

Results: The solution with the greatest temperature change of 19.56°C and a molar mass of 45.02g/mole is the 1/2Acetone+1/2Methanol solution. The solution composed of 1/3Propanol+1/3Acetone+1/3Ethanol with a molar mass of 50.68g/mole had the lowest temperature change, which was 8.34°C.

#### Conclusions/Discussion

Conclusion: In conclusion, the data collected can not support the hypothesis. The only prediction of the hypothesis that was correct was the decision that the solution composed of 1/3Propanol+1/3Acetone+1/3Ethanol would have the lowest temperature change.

#### Summary Statement

The point of this project was to determine how different ratios and combinations of solutions composed of water, Methanol, Ethanol, Acetone and Propanol would affect temperature change and evaporation rate.

#### Help Received

My science teacher gave me the chemicals necessary for this experiment.