



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

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| Name(s) Chase C. May | Project Number J1121 |
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Project Title
How Can Different Polymers Be Identified?

Abstract

Objectives/Goals
How can different types of polymers be identified without looking at the Plastic Identification Code?
The purpose of this science experiment is to identify different polymers (plastics) based on physical and chemical properties so that they can be sorted for recycling before being sent to a recycling center to make recycling easier.

Methods/Materials
In this experiment I will identify the different physical and chemical characteristics of each type of plastic sample: - Color; - Clarity; - If the plastic is Soft and Pliable or Hard and Rigid; - Flame color when the plastic is burned; - Smoke color when the plastic is burned.
I will also determine the density of the plastic samples by comparing them to known densities of liquid solutions. If the sample floats in a liquid solution, the sample is less dense than the liquid solution. If the sample sinks in a liquid solution, the sample is more dense than the liquid solution.

Results
Plastic type characteristics observations:
Each plastic sample has unique physical characteristics, such as color, texture, and clarity.
Each plastic sample has unique chemical characteristics when burned, except for sample 2 & 5, which has the same flame color and smoke color.
Density Test Results:
Plastic type 1 & 4 had the exact same density test results
Plastic type 2 had unique density test results
Plastic type 3 had unique density test results
Plastic type 5 & 6 had the exact same test results

Conclusions/Discussion
Plastic types 2 & 3 can be uniquely identified by using just the density test. None of the other 4 plastic types acts the same as plastic type 2 and 3 which
Plastic types 1 & 4 can be identified by using the density test results and their unique physical characteristics. I compared the plastic color and flame color of each sample. Plastic type 1 is white, and plastic type 4 is green. Plastic type 11 had an orange flame and sample 4 had a very dark orange flame.
Plastic types 5 & 6 can be identified by using the density test and comparing the plastic color of each.
Plastic type 5 is off-white and plastic type 6 is black. Also, plastic type 5 had an orange flame and plastic type 6 had a red and dark orange flame.

Summary Statement
The purpose of this science experiment is to identify different polymers (plastics) based on physical and chemical properties so that they can be sorted for recycling before being sent to a recycling center to make recycling easier.

Help Received
My mother helped me conduct the experiment.. My father helped me type the report and the display boards.