



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Tavit Marokosian	Project Number J0599
Project Title Polarimetry and Hydrolysis of Sucrose	
Objectives/Goals My Project is to measure and compare the rate of Hydrolysis of Sucrose catalyzed by Hydrochloric Acid (HCl) and Invertase Enzyme using a Polarimetric Technique.	
Abstract	
Methods/Materials T Shaped tube was uncapped, the ends of the tube were fitted with two circular glasses and glued to create the sample tube, Then the caps themselves were fitted with the circular polarizers, and screwed back to the tube. Styrofoam Protractor was glued to the front cap. Four metal clamps were used to mount the polarimeter and the laser light. The two Polarimeters were identical except for the T tube, linear polarizers, flashlight, and two circular Styrofoam mounted with a protractor, fitted within each other. Experiment (A) hydrolysis of Sucrose by HCl, 20 g of sucrose and 35-ml of water was mixed and the optical rotation was measured, 10-ml of HCl was poured in the sample tube, and the optical rotation was measured for the next sixty minutes, every five minutes for the Polarimeter with Circular Polarizer and Laser Light and every 2 minutes for 26 minutes for the Polarimeter with Linear Polarizer and Yellow Light. The experiment was repeated two more times with each polarimeter. Experiment (B) Hydrolysis of Sucrose by Invertase Enzyme, 20 g of sucrose and 50 ml of water was mixed and poured in the sample tube of the polarimeter. 8.75 g of active dry yeast was placed in 1 liter 0.1M of Baking Soda and incubated to 40°C for 24 hours. Next, the yeast solution was centrifuged for about five minutes, 1ml of the supernatant was collected and diluted 1/10 dilution and poured in sample tube of the polarimeter. Then the optical rotation was measured for the next sixty minutes, every five minutes (Both Polarimeters). The experiment was repeated two more times with each polarimeter.	
Results The Hydrolysis of Sucrose catalyzed by HCl was much faster than Hydrolysis of Sucrose catalyzed by the Invertase Enzyme. The end time for HCl where Sucrose was completely hydrolyzed into Glucose and Fructose was approximately 24-30 minutes, for the enzyme the end time was much 18 hours.	
Conclusions/Discussion My results agreed with my Hypothesis and showed that the Hydrolysis of Sucrose by HCl was much faster than Invertase Enzyme. There was not a measurable difference between the circular and linear polarizers, but the wavelength of the laser pointer (550) being longer than the yellow light (498) caused a delay in the reaction rate for both experiments.	
Summary Statement My Project is to see whether Hydrochloric Acid or Invertase Enzyme will Hydrolyze Sucrose, using a Polarimeter.	
Help Received Father helped understand concepts and drove me to stores.	