



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Ryan Y. Huang	Project Number S0511
Project Title The Effect of Oxidizing Agents on the Surface Energy of Plastics	
Abstract	
Objectives/Goals Do oxidizing agents affect the surface energies of plastics? My objective is to expose each plastic to an oxidizing agent and to find out the results.	
Methods/Materials	
Methods: Oxidizing Agents were used to change the surface energy of plastic surfaces.	
Materials: Plastics: 70 Polypropylene (3## x 2## pieces); 70 High Density Polyethylene (3## x 2## pieces); 70 Low Density Polyethylene(3## x 2## pieces); 70 Acrylonitrile Butadiene Strylene(3## x 2## pieces); 70 Polyvinyl Chloride(3## x 2## pieces); 70 Acrylic Sheet. (3## x 2## pieces).	
Chemicals: 1 Hydrogen Peroxide (2L bottles); 2 Drano Drain Cleaner (1 L bottle); 1 Three quarts - Clorox; 1 Iodine Bottles (24 ounces bottle); 1 Baking Soda (12 ounce container); 1 Propane.	
Other: 30 Cotton Swabs; 3 Glass Cup; 1 Aluminum Wire; 1 Timer.	
Results Results: The plastics that were treated in Drano, Clorox, and propane seemed to have the biggest changes in my experiments. Baking Soda, Iodine, and hydrogen peroxide made differences, though not as drastic as the others.	
Conclusions/Discussion Conclusion: Plastics that are treated first will have greater surface energies. It is important to treat plastics that will be used in adhesion, for the adhesiveness will be greater.	
Summary Statement Oxidizing Agents were used to change the surface energy of plastic surfaces.	
Help Received Father helped build board.	