



CALIFORNIA STATE SCIENCE FAIR  
2009 PROJECT SUMMARY

<b>Name(s)</b> Yenyu Chen	<b>Project Number</b> <b>S0504</b>
<b>Project Title</b> <b>Electrolyte Turns On the Solar Cell</b>	
<b>Abstract</b>	
<b>Objectives/Goals</b> (1) How do the different berries influence the solar cell's output energy? (2) How does the different used of pencil effect the used of solar cell's output energy? (3) How do different electrolytes influence the solar cell's output energy? (4) How does different amount of Titanium Dioxide affect the solar cell's output energy?	
<b>Methods/Materials</b> (1) Add 10 ml vinegar to 6g Titanium Dioxide. (2) Add one drop of clear dishwashing detergent. (3) Wait for 15 minutes. (4) Test the glass slides with the multi-meter, determine which side is conductive. (5) Mask 3mm on the three sides of the glass. (6) Drop 3-5 drops of the TiO <sub>2</sub> solution on the slide. (7) Wait for the slide to dry and remove tape. (8) Place the slide to dry for a 10-60 minutes. (9) Blend some berries in the blender and add a tablespoon of water for every 10 berries. (10) Put the slide (face down) into the juice (berries + water) wait for 5-10 minutes. (11) Use soft pencil to coat the entire surface of conductive side on the other slide. (12) Burn the conductive glass slide (with the soft pencil drawn on) with a candl. (13) Put two sides together. (14) Drop 1-2 drops of Iodide tincture to the crease between the two slides.	
<b>Results</b> (1) How do different berries influence the solar cell's output energy? Strawberries doesn't work; Blackberries work better than blueberries. (2) How does different used of pencil (2B, 3B, 8B) effect the used of solar cell's output energy? 2B > 3B > 4B > 5B > 6B > 7B > 8B (3) How do different electrolytes influence the solar cell's output energy? I <sub>2</sub> > HCl > Na(OH) <sub>2</sub> (4) How does different amount of Titanium Dioxide affect the solar cell's output energy? 12g/10ml > 6g/10ml > 18g/10ml	
<b>Conclusions/Discussion</b> The first test conclude that blackberries captures the highest energy output from the sun; the strawberry cannot bind with the titanium dioxide. The blackberry has a greater amount of anthocyanin and was well bind with the titanium dioxide. The second test is the test of the different types of pencils, which had showed that the 8B pencil had the highest energy output. When the materials in the solar cell are well blended the more energy output the solar cell produce. The third test conclude that the Iodine tincture works that best; since it is easier for the solar energy to be captured by a darker color than a lighter color.	
<b>Summary Statement</b> The used of different chemical reactions in the solar cell.	
<b>Help Received</b> My chemistry teacher, who had spent time with me and lend me his lab; my advisor, who had read my project and correct my English mistake; and all my other teachers who had helped me as I finished my project. Thank you to my mother, who had drove me to wherever the experiment is going to take place	