



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Oliver Chen	Project Number 31644
Project Title Breakdown of CO(2) through Electrical Discharge	
Objectives/Goals -To find out if it is possible to build a device to create carbon monoxide, for industrial use, from carbon dioxide. -To find out what method is the best for completing this task. -To determine the efficiency of that method. Abstract Methods/Materials Materials: Neon Sign Transformer 10 ft. of 600 volt stranded copper wire, 2ft. of bare copper wire, 20 ft. of # 1 in. pvc pipe, 6 # in. pvc elbows, 6 # in. pvc tees, 5 gal. bucket, 3 gallons of water, 800g. of table salt, 500 ft. of 24 gauge enameled copper magnet wire, two 3 in. Nylon screws, 6 nylon hex nuts, Tungsten spark gap, Carbon monoxide sensor, Oxygen sensor, CO2 tank, plastic container, Vinyl tubing, 1 in. copper tube, Large fan to keep the area ventilated. Procedure: 1. Turn on the fan to ventilate the area. 2. Fill the plastic container with the desired amount of CO2. 3. Measure the carbon monoxide levels inside and make sure they are zero. 4. Make sure there is a safe perimeter around the tesla coil. 5. Turn on the tesla coil for 60 seconds. 6. Record the carbon monoxide levels inside the container every 10 seconds. 7. Repeat for every CO2 level test. 8. After the test leave the pump of the sensor on to clear all the gasses from the container and leave the area until all gasses are cleared. Results CO Production Rates: 1.9% Oxygen: -Total Average : 22.6 ppm per second 10.9% Oxygen: -Total Average: 13.8 ppm per second 20.9 % Oxygen: -Total Average: 6.4 ppm per second Conclusions/Discussion I concluded that it is possible to obtain CO and Oxygen for industrial use by breaking down CO2 through an electrical discharge. Through research I found that this CO could then be used for industrial purposes to make chemicals and fuel. And the oxygen, if captured, could be released back into the atmosphere to replace CO2. This, in turn can help slow down the effects of global warming and help improve our declining air quality. The next steps of my project will be achieving greater efficiency and sustainability by using a van de graaff generator instead of a Tesla coil. This will allow the device to be run off of renewable energy such as wind power. Also I hope to develop new materials to capture CO2 from the air and separate CO and Oxygen that are made in the breakdown process. By doing these things I hope to create a complete system for the capture and recycling of atmospheric CO2.	
Summary Statement The breakdown and recycling of atmospheric CO2 for usefull purposes through electrical discharge.	
Help Received Father helped obtain materials and supervised the experiment.	