



CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s) Riana Lo Bu	Project Number 31924
Project Title Recapturing Carbon Dioxide: Maximizing the Methanol Alternative	
Objectives/Goals The objective of this project: to determine which base is best in recapturing and recovering CO ₂ from the atmosphere, which is the first step toward maximizing the efficiency of this process. Abstract Methods/Materials Materials: weight measurement; 6 (250 mL.) flasks; 3 stoppers with 2 open holes; 3 stoppers with 1 open hole; 3 full stoppers; 3 hollow connecting tubes; 2 pounds of dry ice; potassium hydroxide (KOH) (10g.); calcium hydroxide (CaOH) (10g.); sodium hydroxide (NaOH) (10g.); water; beaker; battery w/ cathode and anode wires; brownley apparatus; 2 large graduated cylinders; 2 washbasins; bucket of ice. Methods: I captured carbon dioxide using strong bases and recovered the carbon dioxide using strong acid by performing a neutralization reaction. I used water displacement to determine amount of carbon dioxide produced. Results The results of the experiment were that barium hydroxide had the highest average percentage efficiency (1.55%), and KOH had the highest average recovery of carbon dioxide (0.0892 g.). KOH came in second with respect to average % efficiency (1.54%) and Calcium Hydroxide came in third with 0.692%. Barium hydroxide came in second with respect to average recovery of carbon dioxide with an average of 0.0481g., and calcium hydroxide was not only least efficient but also the worst recovery agent with an average of 0.0361g. Conclusions/Discussion The results of the experiment did not support my hypothesis because barium hydroxide ended up being the most efficient absorbent. But potassium hydroxide was still the best recovery agent, and it was not far behind in efficiency. The extremely low percent yields and efficiencies were not expected. This was probably due to the fact that the scale of my experiment was too small. The low percent yields cannot rule out neutralization as an effective method of making methanol conversion a cyclical process because a significant amount of carbon dioxide was being collected during the neutralization reaction.	
Summary Statement To determine which base is best for carbon sequestration and recovering of carbon after the sequestration process to be converted back into methanol.	
Help Received Dr.Wahi (high school chemistry teacher) provided lab materials	