CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

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Project Number
J0612

Project Title
Greenhouse Effect

Abstract

Objectives/Goals
The objective is to compare the level of concentrated carbon dioxide (CO2)in the four different gases; (1)Ambient Air, (2)Human Exhalation, (3)Car Exhaust, (4)Nearly Pure CO2 (from baking soda and vinegar).

Methods/Materials
Five test tubes were filled with bromthymol blue indicator solution (15ml of water and 10 drops of bromthymol blue indicator solution to each test tube). Four balloons were filled with one of the four gases each (ambient air, human exhalation, car exhaust, and nearly pure CO2-from baking soda and vinegar). A straw was placed in each balloon's neck and the gas was expelled into each separate test tube. We compared the color to the control vile to note any change. We proceeded to use diluted ammonia to neutralize the carbonic acid and recorded the amount of ammonia needed.

Results
In the results, the car exhaust, once added to the bromthymol solution, was a yellow-green and very close to turning a complete yellow color indicating it has a very high carbonic acid content. The 42.4 drops of ammonia taken to neutralize the carbonic acid in the bromthymol blue was very high in contrast with the 20.8 drops taken for the human exhalation and the 0 drops taken to neutralize the carbonic acid in the ambient air and was also very close to the pure CO2 which took an average of 61.2 drops.

Conclusions/Discussion
Based on my research I learned that CO2 is not the only chemical in the car exhaust. There are also other chemicals such as nitrogen dioxide, formaldehyde, particulate matter, and sulfur dioxide and other harmful chemicals. Research also shows that car exhaust is not the only cause of air pollution. Deforestation and fuel combustion are other causes of air pollution. Since there are high levels of CO2 in the air, there is global warming. Global warming is when the radiant sun energy is trapped by the greenhouse layer to prevent extreme temperature drops during the night.
I have also learned that CO2 is only toxic when it has reached 5% concentration, but we should do our best to try and lessen the atmospheric pollution.

Summary Statement
We are comparing the amount of carbon dioxide in four different gases.

Help Received
Our teacher Mr. Chung Nguy helped get the car exhaust.