CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)

Sirisha Grandhe; Susan Iyican; Guy Rodgers

Project Number

S0507

Project Title

Compact Chemical Scrubbing System for Internal Combustion Engine

Abstract

Objectives/Goals

The objective of this project was to find a way to clean combustion engine emissions. Research indicated that the most efficient way to take the harmful pollutants out of the exhaust gasses was to react them with a solution of aqueous ammonia.

Methods/Materials

Water, aqueous ammonia, and heated aqueous ammonia were used as the solutions to be tested. For each test, the solution was contained in a device made from PVC, which was placed in the exhaust pipe of a leaf-blower engine. In each of the experiments, the engine bubbled exhaust gasses through solution, which was tested before and after to determine its pH, conductivity, and temperature. Three of these tests were conducted using each solution.

Results

The test results showed a drop in alkalinity of the solution to more neutral pH levels, and a decrease in electrical conductivity.

Conclusions/Discussion

This information, supported by further research, was evidence that the exhaust gasses dissolved in the aqueous ammonia, and that the resultant ions reacted to form new, more harmless products. This proved the hypothesis that an aqueous ammonia solution would be an efficient way to filter out the harmful components of combustion engine emissions.

Summary Statement

We built a device that will filter out the hazardous chemical components of internal combustion engine emissions.

Help Received

Used lab equipment from Argo Chemical Inc. under the supervision of Lucas Dobrzanski, M.S. Che.