



**CALIFORNIA STATE SCIENCE FAIR  
2012 PROJECT SUMMARY**

<b>Name(s)</b> Shaelyn P. Topolovec	<b>Project Number</b> <b>J0324</b>
<b>Project Title</b> <b>Combustion Efficiency from Ozone Induction</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> If ozone is introduced into the intake manifold of an internal combustion engine, the fuel efficiency will increase and the emissions will decrease, because ozone is a denser form of oxygen and it improves combustion.</p> <p><b>Methods/Materials</b> Apparatus materials: 14,400 mg/hr ozone generator, 4# x 12# clear plastic pipe, screws nuts &amp; washers, 12 ea 14-16 awg wire couplings, 2 ea in-line fuse holders, 2 ea 2 amp fuses, 2 ea 36 in. 16 awg power cords, Electrical tape, 4 in. x 3 in. reducer, 3 in. x 24 in. flexible metal duct, 2 ea 3 in. hose clamps Testing materials: 2008 Chevy HHR 2.4 liter, Apparatus (above), 12 in. wire ties, 300 watt 12 volt to 120 volt power inverter, 87 octane gasoline</p> <p><b>Results</b> The result of the effect of ozone induction in an engine indicates that ozone helps the fuel efficiency of a car. 0 mg/hr. ozone results averaged: 8.556 liters used in 106.3 kms, 12.4 km per liter, 27.1 HP @ 1800 rpm, 76.9 ft-lbs torque @ 1800 rpm, 15.5% CO<sub>2</sub>, 7,200 mg/hr. ozone inducted results averaged: 7.958 liters used in 106.3 km, 13.4 km per liter, 8.1% improvement compared to no ozone, 32 HP @ 1800 rpm, 90.4 ft-lbs torque @ 1800 rpm, 15.4 % CO<sub>2</sub>, 14,400 mg/hr. ozone results averaged: 7.238 liters used in 106.3 km, 14.7 km per liter, 18.5% improvement compared to no ozone, 32.7 HP @ 1820 rpm, 88 ft-lbs @ 1820 rpm, 15.4% CO<sub>2</sub></p> <p><b>Conclusions/Discussion</b> My hypothesis stated that ozone introduced into the intake of an engine will improve the fuel efficiency and the emissions. I found that my hypothesis was correct. When compared to the control, the 14,400 mg/hr. ozone induction improved the fuel efficiency 18.5%. Of the three levels, the zero ozone level performed the worst. The 14,400 mg/hr. ozone level performed the best. The level with 7,200 mg/hr. ozone performed in-between with 8.1% improvement over standard induction. Discussion: The more ozone that was inducted, the better the fuel efficiency and power was. On the other hand, the torque did decrease slightly with the last stage of ozone induction. The higher engine speed (20</p>	
<b>Summary Statement</b> Will automobile fuel mileage increase and emissions decrease if ozone is inducted into the intake of the engine?	
<b>Help Received</b> Dad, Construction Help; Mom, Board Assembly Help; Apache Smog, Emissions Test; Teacher, Project Advisement	