# System of Retention and Transformation of Polluting Substances Generated by Gasoline Automobiles

Diaz Martinez, Sarah (School: Centro de Bachillerato Tecnologico Industrial y de Servicios No. 118)
Morales Trejo, Martin (School: Centro de Bachillerato Tecnologico Industrial y de Servicios No. 118)

The internal combustion gasoline automobile is the most used transportation mode in Mexico and the world. The burning of this fossil fuel generates polluting substances such as oxides of nitrogen (NOx), carbon monoxide (CO), carbon dioxide (CO2), sulfur dioxide (SO2), hydrocarbons (HC), and soot particles (MP); this makes the car an important factor in environmental pollution and a source of health problems. Currently, the systems and processes to reduce polluting emissions can be inefficient or economically inaccessible. The hypothesis is analyzed that, if the polluting substances emitted by a gasoline car may be retained and transformed, then the rate of the polluting emissions of the vehicle may be reduced. For its verification, a system was developed that by means of neutralization reactions transforms the oxides into salts and retains the hydrocarbons with activated carbon. To develop the system, a 4-cylinders non-stop working car (taxi) with a 1.6-liter engine was chosen; Its emissions per liter of gasoline were calculated and thereafter a device with mechanisms and materials that optimize the operation was designed and manufactured. The system was installed in the exhaust of the test car, and 92.35% of the CO2 emissions were reduced, later a sample of the used solution was studied where the generation of carbonated salts may be safeguarded or used in other areas. The results prove hypotheses, since, by implementing the proposed system, it was possible to reduce the polluting emission rate of the test car.

**Awards Won:**