

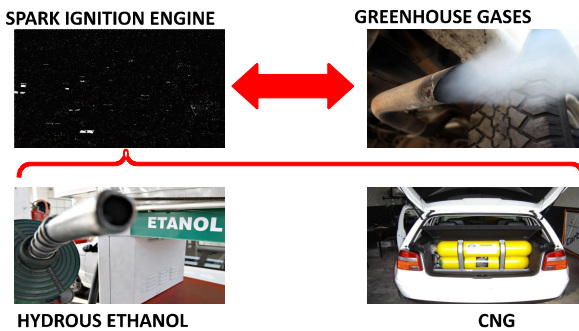
# A study of emissions from S.I engine fueled with concomitant injection of ethanol and CNG

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INTRODUCTION



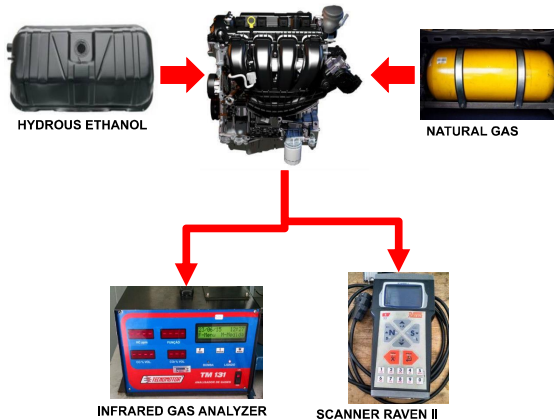
## OBJECTIVE

To evaluate the emission of exhaust gases especially carbon dioxide (CO<sub>2</sub>), carbon monoxide (CO), hydrocarbons (HC) and nitrous oxides (NO<sub>x</sub>) derived from a vehicle with flex engine by reference to natural gas, a concomitant injection of hydrated ethanol.

## MATERIALS AND METHODS

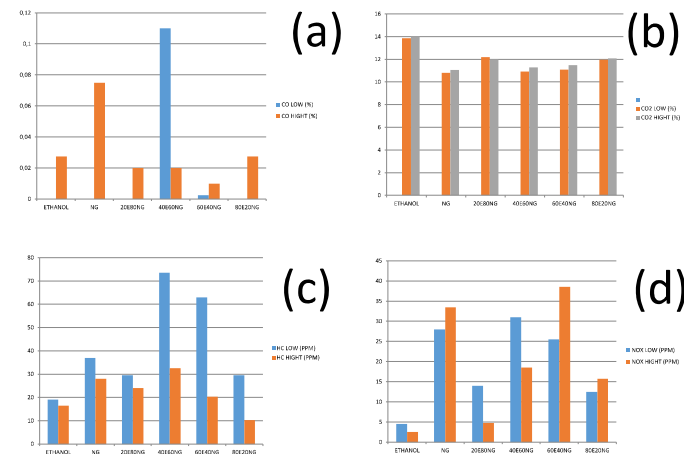
The experiments were performed in a sedan vehicle equipped with a flex fuel engine 2.0 of 2009. The vehicle was fitted with a natural gas rig relaying electronic injection, comprising a high-pressure cylinder (200 bar) with cylinder valve having a security system, high pressure tubing, supply valve central command key selector fuel, natural gas injectors operating at 2 atm. low pressure pipe.

## FLEX FUEL ENGINE 2.0 (2009)



METHODOLOGY

RESULTS AND DISCUSSION



The addition of hydrated ethanol to the natural gas allowed combustion with lower concentrations of CO<sub>2</sub>, CO and HC, however the NO<sub>x</sub> emissions increased. This can be attributed to the mass of O<sub>2</sub> present in the hydrous ethanol formulation.

CONCLUSIONS

- The use of the concomitant injection of hydrated ethanol and natural gas in flex model vehicles proved feasible for the reduction of CO, CO<sub>2</sub>, HC and NO<sub>x</sub> emissions.
- Concomitant injection of hydrated ethanol and natural gas can be a solution to reduce emissions from exhaust gases from vehicles in large urban centers.
- The E20NG80 blend is the one that best meets the environmental aspect.

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