

Catalytic Enhancement of the Combustion of Landfill and Anaerobic Digestion Biogas in a Gas Engine

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- To examine and identify the mechanisms and factors that are critical for reducing emissions from biogas use for generating electricity.
- To improve flame stability by means of catalytic hydrogen formation without the need for pre-conditioning landfill gas.

Experiment Method

The emissions generated from a gas engine will be compared in the following tests:

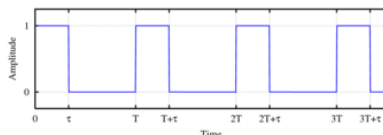
- ① Type A: without catalysts.
- ② Type B: 90% of fuel is injected to IC gas engine, and 10% of that is injected to the engine via catalysts.

Use 2 kinds of fuels in the experiment:

- ① LFG (Landfill Gas)
 - Type A: CH_4 50%
 - Type B: $\text{CH}_4 \geq 20\%$
- ② NG (Natural Gas)

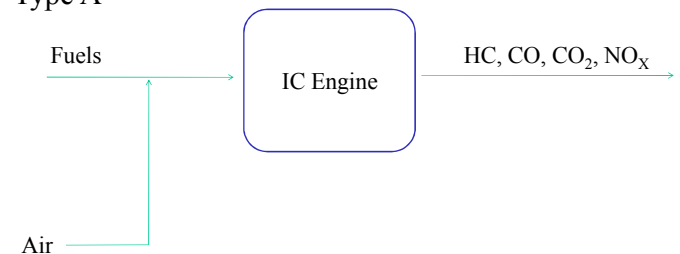
Measured values:

- ① The components of emissions:
 - Conversion of fuels
 - Efficiency of catalyst
 - Effect of CO/H_2 on emissions
- ② Thermodynamic factors
 - Temperature
 - Pressure
 - Heat or Energy
- ③ Efficiency of the engine
- ④ Duty Cycle:

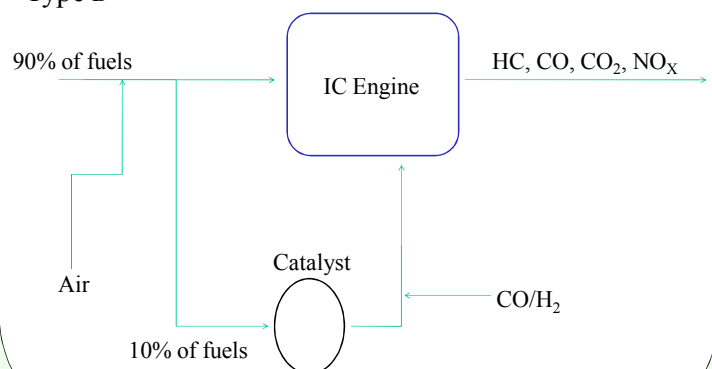


Comparison Tests

Type A



Type B



HONDA Triple Fuels 5HP GC 160 Generator



The Engine used in the Experiment

Specifications of the engine that will be used in this experiment:

- ① Small, simple, and light
- ② One or more cylinder and 4 cycles engine
- ③ Gas-fuel engine