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An Advancement to Reduce Pollution Effectively by Using TI Nanotubes in Aqua Silencer

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Abstract

Automobile is the field which is known for pollution in many ways. To overcome pollution many new inventions is existing yet here would be some drawback behind those. This paper is all about Aqua silencer, its working and also the method to overcome the drawback of using charcoal in it. The Aqua Silencer is used in the exhaust to direct the gas from the engine after going through the process of reducing the toxic gases and also water is used to reduce the exhaust noise. In this silencer, the main drawback is using charcoal to reduce the exhaust toxins which should be replaced in the span of 3 years approximately. Hence, in this research I have made an attempt to increase the life time of the silencer functioning by using Titanium Nano-tubes along with charcoal which has the ability to absorb the toxin gases.

Keywords: components; Aqua Silencer; Titanium; Nano-tubes; Charcoal.

Introduction

The purpose of this research is to overcome pollutions in an efficient way rather than using conventional silencers. The conventional silencer is source route for air and noise pollutions. Hence, to reduce these aqua silencers are used which is the latest invention in the trend to reduce these two pollutions yet it has a drawback that the silencer cannot fulfill the job as the charcoal and water should be replaced and the duration or the lifetime of the silencer function gradually reduces.
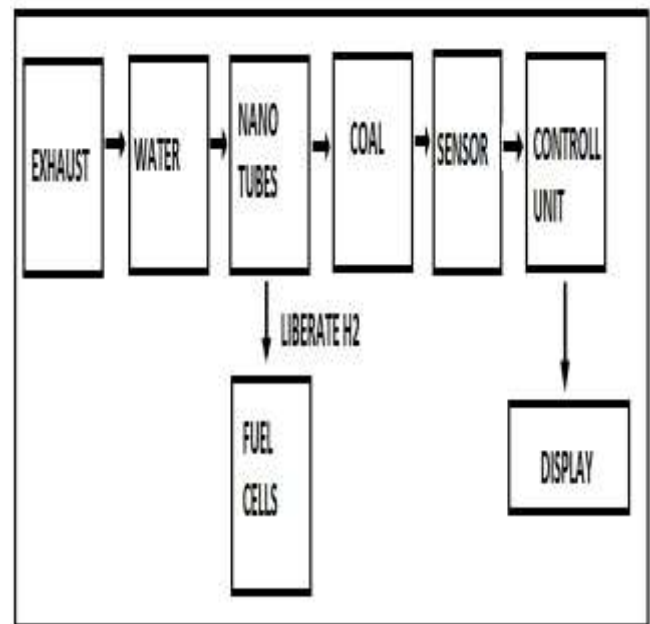
Requirement

Hardware requirement
a) MPC555
b) Relay
c) Infotainment System
d) Silencer tube
e) Titanium Nano-tubes
f) Charcoal
g) Water Tub
h) Ruthenium Sensor

Software requirement
a) EMBEDDED C
b) Code Warrior

Field requirement
a) Embedded Systems
b) Automobile
c) Mechanical

fig-1- General Block Representation of Working Mechanism of the Aqua Silencer and Titanium Nano- Tubes

The Devices and Peripherals Used

The following are the devices or peripherals attached to the microcontroller and the specification for why it is beginning used here.

MPC555 Microcontroller

In this research, MPC555 is preferred to control the ruthenium sensor. In the controller, the data related to the level of the water and the hydrides and oxides liberation and consistency are loaded in the microcontroller so that a logic comparison occurs between the input and the excitation signal's output of the sensor circuit.

The CAN protocol availability in the controller helps to fetch the signal from the sensor circuitry and display it in the dashboard when the certain critical situations emerge during the scenario based on the charcoal absorption and the hydrogen molecules liberation from the Ti nano-tubes. This would helps in monitoring the fuel cell charge content.

Titanium Nano-Tubes

The Nano-tubes are polymers which have the manganese in its which will trap the gasses and separates the hydrogen molecules. These hydrogen molecules can be used as regenerative to charge the fuel cells. The nano-tubes are fitted in the water absorption chamber so the purification process is reduced and does not require separate technique.
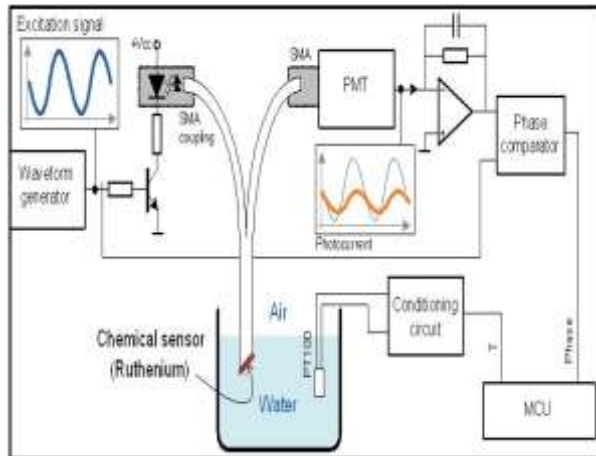
Ruthenium Sensor

Fig-2 Ruthenium Sensor and control process

The Ruthenium Sensor is the effective way of identifying the water condition and the indication is given on the dashboard. It consists of optical fiber which acts as the transducer to transmit the signal to the control unit. The indication of the sensor denotes the coal and Nano-tubes.
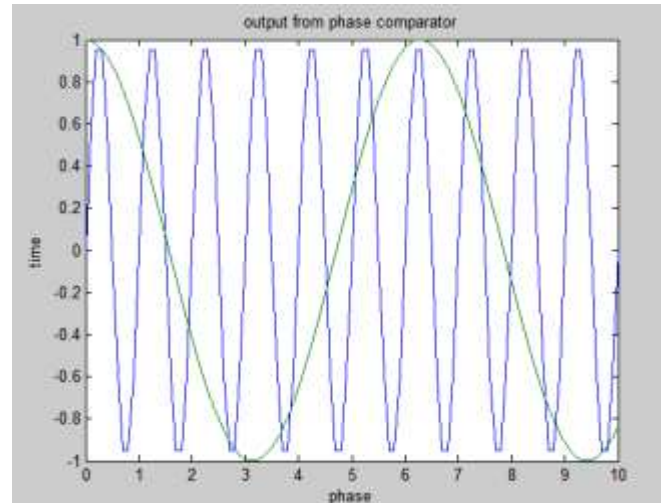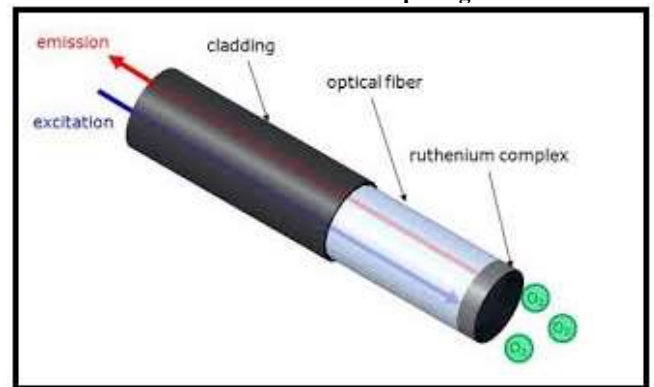

fig-3 the graph which indicates that phase would differ when the time instances of the input signal.

Silencer Tube

Unlike other conventional silencers, the exhaust is not directly connected to the end environment. The exhaust gas will undergo several purification processes before reaching the atmosphere. The silencer chamber is made up of steel alloy so that it can withstand the heat to behave as a good conductor. The exhaust chamber terminal is immersed in the water tub so that the noise is not heard which is the basic principle that any noise producing body immersed in water will not produce noise. The charcoal is responsible for absorbing toxins from the exhaust which is the purification process of the water.
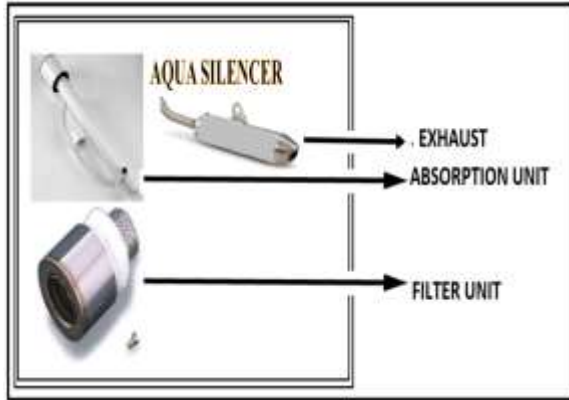
Fig-4- Aqua Silencer components

Relay

        A relay is an electrically operated switch. The function of the relays in the control unit is for controlling the movement of robot's base with respect to the on or off position of the two infrared sensors and an ultrasonic sensor. There are five "JQC-3FC (T73)" relays in which the two of it controls the left and right motion of the robots movement whereas the next two controls forward and backward movement. The rest one relay is used for controlling camera which is in on position only when ultrasonic sensor is on.

CAN Bus

        The CAN bus here is used to take the signal from the ruthenium sensor control system to the main ECU board so that the display in the dashboard will alert the level of water and the absorption unit's charcoal quality and the charging of the fuel cell from the nano-tubes as it liberates the hydrogen molecules.

Transformers

        The transformer used here is a step down transformer where the 230 v is converted into 12v. There is two such transformer which produces AC voltage where both its supply are joined together and one is connected to the four diodes whereas the other is connected for the sensor's supply, in order to operate it successfully.

Infotainment System

        The infotainment system is used in order to alert driver when need a raises. In case the driver using the moving vehicle cannot control the vehicle then in that case a alert message either in the form of voice coded signal through speaker or any other infotainment system is used by which at least human in the vehicle can be safe.

Operation

        In this research, we made an attempt to reduce pollution produced by the power train by using same system of aqua silencer but in a more

efficient way by adding the Titanium Nano-tubes in the silencer in the presence of charcoal and water which plays a vital role in controlling pollution.

Algorithm

Step-1: Supply of 12v is connected to the controller unit.
Step-2: Microcontroller unit along with the Ruthenium Sensor is active.
Step-3: Now the signal is transmitted / received in a definite pattern.
Step-4: The exhaust gas flows into the water tub
Step-5: The water tub is responsible for reducing noise and dissolves toxins in the gasses
Step-6: The nano-tubes are responsible for regenerating hydrogen molecules to the fuel cell
Step-7: The sensor works on the following condition:
    If the water contamination is high tthen the phase comparator sends the high voltage signal to the control unit which displays replace
    Else active
Step-8: Stop.

Flow Chart
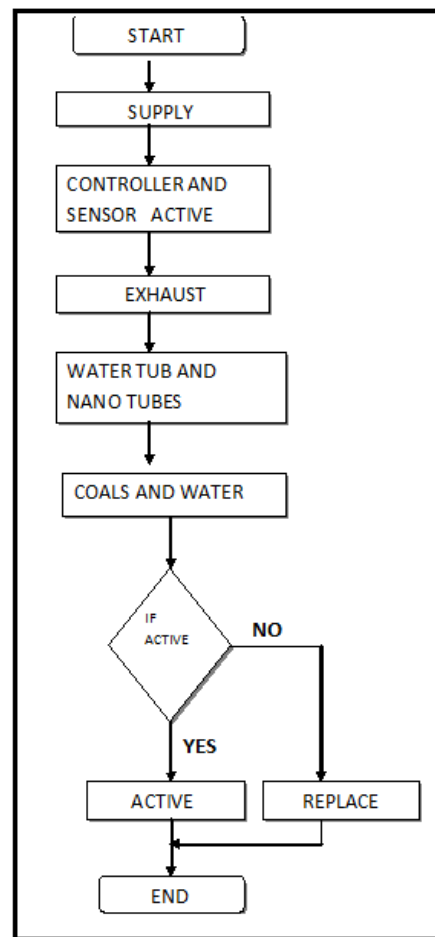
Applications

It provides additional support to the fuel cell as the polymer have the capability to regenerate the hydrogen molecules effectively.
The pollution free atmosphere is efficiently created.
No compensation on the speed is required
This can also be used in industries to avoid water, air and noise pollution It avoids unwanted vibration which are produced during idle state of the vehicle

Conclusions

Thus the full paper concentrates on the reduction of the air pollution and water pollution along with eliminating noise. This research portraits on the effective way of managing vehicle parameters to fulfill the emission norms.

Acknowledgment

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