

Short Communication

Utility of a catalytic converter with Nano-particles for decreasing exhaust gases concentration emitted from automobiles

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Abstract

Environmental air pollution has emerged as a grave problem for the present generation. Specially, the vehicles based on the diesel engines are major culprits in this cause. This research work is directed on providing an effective and efficient solution for pollution prevention from automobiles using a catalytic converter coated with nano-particles as catalyst. An effective design of a catalytic converter for pollution prevention is proposed in this research work.

Keywords: Air pollution, catalyst, catalytic converter, diesel engine, pollution.

Introduction

The diesel engine automobiles are present in huge numbers but there is lack of an effective method to keep the pollution level from this enormous number of vehicles in check¹. The concentration of engine combustion exhaust emissions increases to a very high level if there is any malfunctioning in functioning of an engine². Inhalation of harmful exhaust gases of combustion such as carbon mono-oxide may invite a wide variety of health problems like cancer. Other harmful exhaust gases include hydro-carbons and oxides of nitrogen³. To reduce the rising level of the harmful exhaust gases in the atmosphere, nano-technology can be used in combination with catalytic converter.

The main utility of nano-particles is due to their nano-size which is very effective in decreasing the concentration of harmful products of the exhaust^{4,5}. Nano-particles are increasingly being employed in different areas of technology due to their excellent properties. Nano-technology has emerged to be an excellent alternative for various problems^{6,7}. Iron oxide has shown excellent properties for reduction of exhaust emissions among various catalysts used in a catalytic converter. Also, its less cost is an attractive property which encourages its application in a catalytic converter⁸.

Materials and methods

Different types of catalysts are used in catalytic converter. They include oxidation catalysts and reduction catalysts. Oxidation catalysts are very helpful in oxidation of harmful emissions like carbon mono-oxide in to less harmful carbon di-oxide and hydro-carbons in to water and carbon di-oxide. Reduction catalysts are very helpful in reducing the oxides of nitrogen in to pure nitrogen gas⁹⁻¹¹. Multi Gas Analyzer can be used to measure the concentration of various exhausts precisely. Different models of gas analyzers exist and any model can be selected as per the given requirement^{12,13}.

Results and discussion

In the present era, air pollution from automobiles has become a curse and many researches are ongoing to find an effective method to control it. In the current research work, a brief description about nano-technology based method to prevent the air pollution has been given. The method is based on nano-particles acting as catalyst to decrease the emissions level. Nano-particles are very helpful due to special properties possessed by them which are very effective in oxidation and reduction of emission gases giving harmless products at the end of reaction.

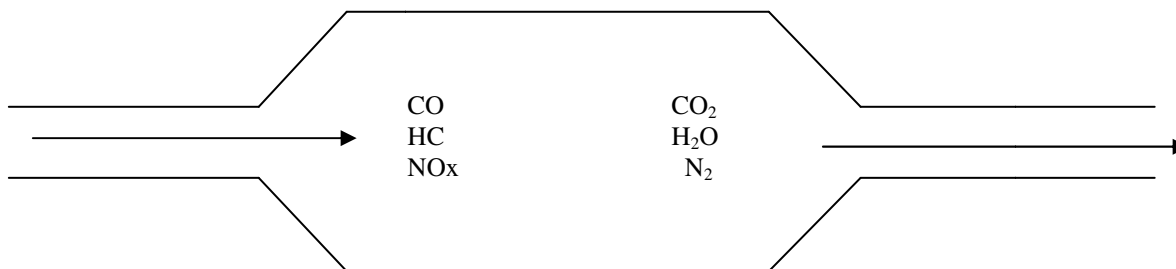


Figure-1: Catalytic converter.

Conclusion

This work of research is based on the importance of catalytic converter with nano-particles for decreasing exhaust gases emissions emitted from automobiles. Various methods are available for decreasing pollution in the atmosphere but the present method appears to be very promising in terms of cost effectiveness and implementation convenience.

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