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Development of an ANN model for prediction of performance and emission parameters of a single cylinder CI engine fueled with diesel-biodiesel-ethanol blends

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In the present study an experiment was conducted to harness the synergetic benefit of Mahua (*Madhuca indica*) biodiesel to reduce PM emissions as compared to diesel. Upon doing with biodiesel subsequent experimentation yielded that there was a reduction of PM but with simultaneous increase in NOx emissions. To tackle this problem and without hurting the sentiment of renewability and sustainability of the fuel resource biomass derived sources, we choose ethanol as an *in situ* agent. An artificial neural network model was developed as a reliable and robust system identification tool to predict the BSFC, BTE, NHC and PM based on the experimental data with load and fuel blends as inputs for the network. The developed ANN model was capable of predicting the performance and emission parameters with commendable accuracy as observed from correlation coefficients within the range of 0.998833 to 0.999981, mean absolute percentage error in the range of 0.65-1.91% along with noticeably low root mean square errors. This suggests the inherent sensitivity and robustness of the network in its proficiency to map the performance and emission values simultaneously with excellent accuracy independent of the case of engine operation.

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Use of cobalt-graphene in place of platinum in catalytic converter

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Today in the modern world the most important problem faced by the mankind is increasing pollution at a very high rate. It affects the ecosystem of the environment and also aids to increase the greenhouse effect. The exhaust gases from the automobiles are major cause of pollution. Automobiles have increased to a large number which has increased the pollution of our world to an alarming rate. There are two methods of controlling the pollution namely, pre-pollution control method and post-pollution control method. This paper is based on controlling the emission by post-pollution control method. The ratio of surface area of nano particles to the volume of the nano particles is inversely proportional to the radius of the nano particles. So decreasing the radius, this ratio is leading resulting in an increased rate of reaction and thus the concentration of the pollution is decreased. To achieve this objective, use of cobalt-graphene element is proposed. The proposed method is mainly to decrease the cost of platinum as it is expensive. This has a longer life than the platinum based catalysts.

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