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## Experimental investigation of the effect of antioxidant into biodiesel in a compression ignition engine

Md Abul Kalam, H H Masjuki, H K Rashedul and A M Ashraful University of Malaya, Malaysia

**B** iodiesel has been a promising clean alternative fuel due to its better physicochemical properties. However, previous studies found that biodiesel can greatly reduce HC, CO and PM emissions except NOx emissions as compared to diesel fuels. The fuel bound oxygen in biodiesel is one of the reasons to produce higher NOx emission. Currently, B20 is being used in several countries as short term operation. The long term operation may not be suitable due to its material compatibility in respect to changing weather conditions and costs effectiveness. In this study, the effect of antioxidant additives on fuel properties, engine performance and emission characteristics of an engine fuelled with biodiesel were investigated and compared with conventional diesel fuel. For this study, four fuel samples including pure diesel, B30, B30+2-Ethylexyl nitrate, B30+Butylated hydroxytoluene, B30+2, 2'-methylenebis (4-methyl-6-tert-butylphenol) were used in a four stroke DI diesel engine. The engine was tested in different load-speed operating conditions as according to SAE engine test method. Among all the additives 2, 2'-methylenebis (4-methyl-6-tert-butylphenol) with B30 shows the best results in terms of lower NOx emissions, higher brake power, lower CO etc. The average reduction of NOX emission for 2-Ethylexyl nitrate, B10 without additives. All the additives blend showed significant reduction in CO and smoke emissions due to better fuel properties as well as better combustion as compared to diesel and additive free B30.

## **Biography**

Md Abul Kalam is working as a Senior Lecturer at the Department of Mechanical Engineering, University of Malaya, Malaysia. He has obtained his undergraduate degree from KUET (Bangladesh), Master and PhD from University of Malaya. His research areas include fuel combustion, bio-lubricant and biofuels testing in IC engines. He has published many ISI journals and his H-index is 21.

kalam@um.edu.my

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