International J. of Engg. Research & Indu. Appls. (IJERIA). ISSN 0974-1518, Vol.5, No. IV (November 2012), pp. 133-146

EFFECTS OF ETHANOL, DIESEL AND WATER EMULSIONS ON PERFORMANCE, EMISSION AND COMBUSTION PROCESSES IN A DI- DIESEL ENGINE

PENIEL PAULDOSS S.¹, MICHAEL N. KUMAR² AND SUNDAR RAJ C.³

¹ Research Scholar, Karunya University, Coimbatore, Tamilnadu, India
² Professor, Aero-space Engineering, Karunya University, Coimbatore, Tamilnadu, India
³ Director (R&D), AVC College of Engineering & Technology, Mayiladuthurai, Tamilnadu, India

Abstract

Tetra Methyl Ammonium Bromide (TMAB), a new additive allows the splash blending of ethanol in diesel in a clear solution. The objective of this investigation is to first create a stable ethanol diesel blended fuel with 2% TMAB as surfactant and then to generate performance, combustion and emission data for evaluation of different ethanol content on a single cylinder diesel engine without any modification of engine (thermal barrier coating). Result shows improved performance with blends compared to neat fuel for all conditions of the engine. Drastic reduction in smoke density is found with the blends as compared to neat fuel. NO_x emissions were found to be high for the blends. The oxygen enriched fuel increases the peak pressure and rate of pressure rise with increase in ethanol ratio. Heat release pattern shows higher premixed combustion rate with the blends. Longer ignition delay and shorter combustion duration are found with all blends than neat diesel fuel.

Keywords: blended fuel, additives, performance, emission characteristics.

© http://www.ascent-journals.com