International Journal of ChemTech Research
CODEN (USA): IJCRGG ISSN: 0974-4290
Vol.9, No.01 pp 105-112, 2016

Effect of piston bowl geometry on the performance of a diesel engine using Corn biodiesel and its diesel blends

A.Ravichandran[1*], K. Rajan[2], M.Rajaram Narayanan[3], K.R.Senthil Kumar[4]

[1,2,3] Department of Mechanical Engineering, Dr.M.G.R. Educational and Research Institute, University , Chennai-600095, India.
[4]Department of Mechanical Engineering R.M.K.Engineering College, Chennai. India.

Abstract: In this study, the performance and emission characteristics of a single cylinder diesel engine with the effect of piston bowl geometry [hemisherical cavity piston (HCP) and toroidal cavity piston(TCP)] using diesel and corn oil methylester and its diesel blends have been ivestgated under different loading conditions. The refined corn oil was converted into corn oil methyl ester by transesterification process and then used to prepare biodiesel/diesel blends. Then the base engine hemispherical cavity piston is machined to make toroidal type piston without affecting its cavity volume and without affecting the compression ratio of the engine. The engine tests were conducted with neat corn oil methyl ester (B100) and 25% blend with diesel (B25) in a diesel engine with hemispherical cavity piston (HCP) and toroidal cavity piston (TCP). The results showed that the brake thermal efficiency of neat corn oil biodiesel and its blends for toroidal cavity piston operation was increased and the CO, HC and smoke emissions were decreased at full load. The NOx emissions were slightly increased for corn oil methy ester and its diesel blends with toroial piston operation compared with diesel fuel with HCP operation.

****