

A Comparative Study of Particulate & Emission Characterization from Diesel and Biodiesel Exhausts

By

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This study was set out to characterize particulate emissions from diesel engines using (1) diesel and a blend of 20% biodiesel with diesel (B20) as fuels in terms of metals and benzene soluble organic fraction (BSOF), Indicator of toxicity and carcinogenicity. It was also intended to identify the sources of metals in exhaust particulates. The characteristics and composition of Diesel Particulate Matter (DPM) vary with engine operating conditions/ loads.

To characterize emissions, a transportation engine (Mahindra MDI 3000) was operated at idling, 25%, 50%, 75% and 100% engine load conditions.

Results clearly suggests reduction in soot emission, Cd, Pb, Na, Zn, Ca, Ni and Mg in DPM of B20, compared to soot emission and metals in DPM of mineral diesel. This reduction was attributed to relatively low levels of metals in biodiesel and near absence of aromatic compounds in biodiesel. However BSOF has increased in biodiesel generated DPM, compared to diesel generated DPM. This necessitates that speciation of organic compound is done for DPM of both the fuels clearly establish comparative organic toxicity of the two fuels.