ONLINE ISSN : 1349-273X
PRINT ISSN : 1346-8804

Journal of the Japan Petroleum Institute
Vol. 48 (2005) , No. 4 pp.229-236

[PDF (488K)] [References]

Effect of Fuel Additives on Reduction of Smoke and Particulate Matter, and Stabilization of Cycle-to-cycle Variation

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(Received: October 25, 2004)

Non-metallic additives are useful countermeasures to reduce smoke and particulate matter from diesel engine emissions. Non-metallic additives include nitro- and oxygenates, oxygenates and nitrogenates. Nitrites and nitrates can reduce smoke and particulate matter in the direct fuel injection engine under constant conditions of 2100 rpm and 80% load. In particular, *n* -hexylnitrite added to gas oil improved particulate matter and NO_x reduction, and fuel consumption efficiency in the indirect fuel injection engine under Japanese 10·15 mode operation. These additives also reduced the cycle-to-cycle variation of maximum pressures in the cylinder. Smoke concentration decreased with increasing oxygenate concentration. However, oxygenates increased fuel consumption and did not stabilize cycle-to-cycle variation.

Keywords: Gas oil, Fuel additive, Particulate matter reduction, Cycle-to-cycle variation, Nitrite, Nitrate

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Petroleum Institute, Vol. **48**, No. 4, p.229 (2005) .

doi:10.1627/jpi.48.229
JOI JST.JSTAGE/jpi/48.229