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燃料特性对车用柴油机有害排放的影响

谭丕强, 赵坚勇, 胡志远, 楼狄明, 杜爱民

同济大学, 汽车学院, 上海 201804

Effects of fuel properties on exhaust emissions from diesel engines

TAN Pi-qiang, ZHAO Jian-yong, HU Zhi-yuan, LOU Di-ming, DU Ai-min

School of Automobile, Tongji University, Shanghai 201804, China

全文: PDF (956 KB) HTML (1 KB) 输出: BibTeX | EndNote (RIS) 背景资料

摘要 研究了车用柴油机燃用不同品质燃油时,其排气烟度、颗粒PM、氮氧化物NO_x、碳氢HC和一氧化碳的排放特性,采用了五种不同硫含量、芳烃含量和十六烷值的柴油,进行了发动机台架实验和模拟整车NEDC循环实验。结果表明,随着燃油硫含量的减少,柴油机排气烟度、HC、CO、SO_2排放有所下降;模拟整车NEDC循环的PM排放显著降低;NO_x排放的变化幅度很小。随着燃油芳烃含量的降低,柴油机排气烟度、PM、NO_x、HC、CO排放的降幅显著。随着燃油十六烷值的升高,柴油机的排气烟度大都呈持续下降趋势;PM、HC排放显著降低;NO_x、CO排放的变化幅度较小。

关键词: 柴油机 燃油 硫含量 芳烃含量 十六烷值 排放

Abstract: Exhaust emissions from a vehicle diesel engine with different property fuels were studied, and the emissions include exhaust smoke, particulate matter (PM), nitrogen oxide (NO_x), unburned hydrocarbon (HC), carbon monoxide (CO) and sulfur dioxide (SO_2). Engine bench test and simulated New European Driving Cycle (NEDC) test cycle were operated on the engine with five kinds of fuel, and the fuels have different sulfur content, aromatic content and cetane number. The results show that exhaust smoke, HC, CO and SO_2 emissions decrease with fuel sulfur content decreasing, and the PM emission under the simulated NEDC test cycle decreases remarkably, while NO_x emissions was not affected obviously. With fuel aromatic content decreasing, emissions including exhaust smoke, PM, NO_x, HC and CO descend distinctly. With cetane number ascending, the exhaust smoke, PM and HC emissions decline evidently, while NO_x and CO emissions have very small changes.

Key words: diesel engine fuel sulfur content aromatic content cetane number emission

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通讯作者: 谭丕强(1974-),男,博士,副教授,主要从事汽车清洁燃料和排放控制研究,E-mail:tpq2000@163.com。 E-mail: tpq2000@163.com

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