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Emissions from In-use Buses and Light Duty Trucks Operating on Palm Methyl Ester and Coconut Methyl Ester in Thailand

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Abstract

Biodiesel is attracting attention as an alternative fuel which will allow us to reduce fossil fuel use and help to lower greenhouse gas emissions than fossil fuels. Besides this effect, it can also help to reduce air pollutant emissions such as carbon monoxide (CO) and particulate matter (PM). In this paper, exhaust emission characteristics of in-use buses and light duty trucks operating on palm methyl ester (PME) and coconut methyl ester (CME) in Bangkok, Thailand are compared with petroleum diesel by chassis dynamometer emission testing. The test fuels are 100% petroleum diesel, PME20 (20% PME and 80% petroleum diesel) and CME20 (20% CME and 80% petroleum diesel). The overall test results show that nitrogen oxide (NO_x) emissions from PME20 are slightly higher compared with those from diesel. CO and PM emissions from PME20 and CME20 are lower than those from diesel, and larger reductions were observed for PM especially in CME20. Carbon dioxide (CO₂) emissions are almost comparable with no significant difference among the different fuel types. This study indicates that utilization of PME and CME might reduce local air pollutant emissions without increasing tailpipe CO₂ emissions, and also indicates that CME has greater reduction potential than PME.

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