

After-Treatment System for Diesel Vehicle Emission Using Non-Thermal Plasma With Novel Electrodes

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In this research, with the aim to successively remove particulate matter (PM) and nitrogen oxide (NO_x) from exhaust emissions of diesel engine, non-thermal plasma (NTP) system is now under development for a practical use. The model system for generating plasma with unit cell of the NTP reactor was designed and developed for the quantitative analysis of discharged plasma. The novel NTP reactors with newly developed electrodes show excellent plasma specificities such as breakdown voltage (minimum voltage for an electric discharge) and radiation luminance. A virtual vehicle system using an engine dynamometer, aiming at the performance evaluation of the plasma PM removal system as various modal driving schedules, was constructed. It is confirmed that the novel NTP reactor shows not only excellent PM removal rate but also minimized pressure loss. Especially, PM removal properties are strongly influenced in the increase in plasma radiation luminance.