

Research Trends and Results

Exhaust Gas Characteristics of Freight Vehicle on the Real Road

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1. Introduction

Among the loads on environment by motor vehicles in Japan, the influence by freight motor vehicles and buses take 40% in CO₂ and 80% in NO_x. So it's important to understand the actual conditions of exhaust emissions on the real road. Therefore, how to understand the influence coming from driving on real roads was an issue.

In this investigation, on-board emission measurement system was used for analysis of exhaust gas.

2. The Summary of the Results

This analysis was executed under 2 conditions. One was measured on test road, the other one is on real road.

As the result of experiments, amount of emissions of CO₂ by real road traffic was more than that of test road traffic. (reference figure-1). After analyzing the data, this difference comes from the influence of acceleration and deceleration on the real road.

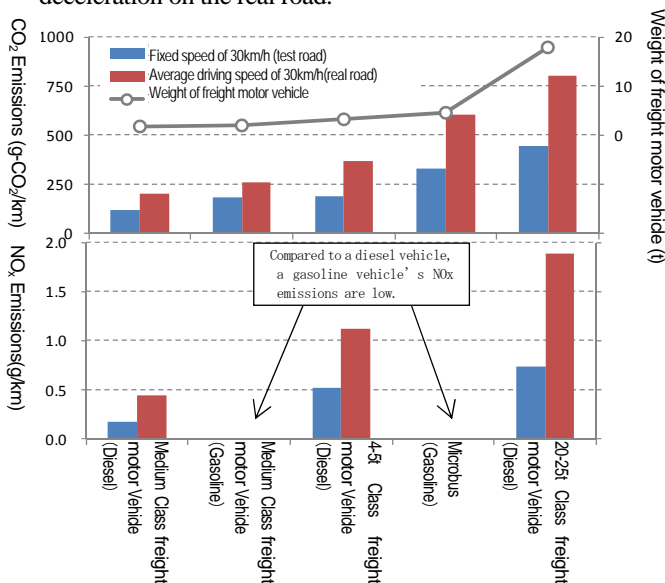


Figure 1 Exhaust Amount of CO₂, NO_x

3. Grasp of Exhaust Gas Characteristics

According to the analysis of the driving time and exhaust gases of 20-25t class heavy freight motor vehicles (diesel), during acceleration the vehicle

discharged twice the CO₂ emissions compared to that of fixed velocity. (reference figure-2)

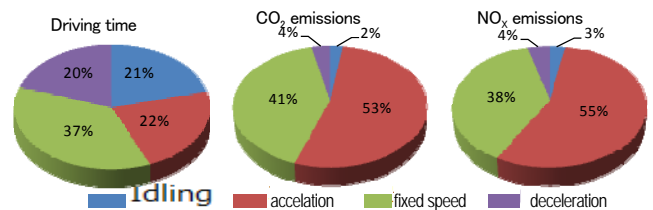


Figure 2. The ratio of Driving Time, Exhaust Amount of CO₂, NO_x (Heavy Freight Motor Vehicle 20-25t Class--Diesel)

We showed the same kind of analysis result which object was an ordinary motor vehicle (gasoline). (figure-3) Compared with figure-2, the ratio of hourly exhaust amount of CO₂, NO_x while idling was greater. From this viewpoint, the idling stop measure for cars was deduced to be effective.

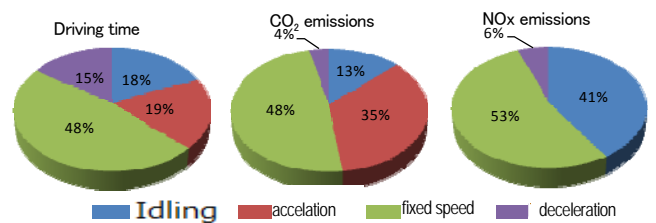


Figure 3 The ratio of Driving Time, Exhaust Amount of CO₂, NO_x (car-gasoline)

4. Conclusion

From the investigation, we clarified that the exhaust gas characteristics differs by the kinds of motor vehicle, especially the acceleration of freight motor vehicle have the great influence on the exhaust amount of CO₂, NO_x. Because those vehicles need time and driving power to accelerate them.