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Diesel powered vehicle fleet Carbon Monoxide (CO), Nitrogen monoxide (NO) and Carbon dioxide(CO2) emission factors in Rwanda.

strong text
Exhaust emissions from road traffic are considered as major contributors to urban air pollution. Diesel powered vehicle emissions are classified as the main source of traffic emissions that count for a higher emission percentage (40% of total emissions in Kigali) in different cities. In addition to different air pollutants from diesel vehicles'exhaust that act as precursors to the ozone formation, diesel engines emits Carbone dioxide (CO2) which is a greenhouse gas contributing to the global warming and Black Carbon(BC) which is a major contributor of the diesel particulate matter. The age of vehicle fleet, maintenance and driving condition play a big role in determining the emission factor of the vehicle fleet. On road Mobile emissions tester (E-6500, E-8500, and E-900) were used to collected vehicle emission data from 55 diesel powered vehicles'exhaust in five different provinces (Kigali city, Western province, Eastern Province, southern province and North Province) of Rwanda in 2022. The so called, very old vehicles fleet (manufactured before 2004) recorded higher carbon monoxide (CO) and nitrogen oxide (NO) emission factors compared to new vehicle fleet (manufactured after 2015). CO and NO emission factors increased with the fleet age whereas CO2 emission factor decreased with the vehicle fleet age. CO/CO2 ratio reduced considerably from new vehicle fleets to old and very old vehicle fleets respectively. This was a good indicator that most of the old and very old vehicle fleets run under fuel rich condition whereas new vehicle fleets run under fuel lean condition. This work also revealed that most vehicle fleet in Rwanda are more than 15 years old and their engines run under fuel rich conditions.

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