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Real emissions, driving patterns and fuel consumption of in-use diesel buses operating at high altitude

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Abstract

We report simultaneous measurements of fuel consumption, driving patterns, and CO₂, CO, and NO_x emission factors for diesel passenger buses under real operating conditions in high altitude cities (>2000 masl) and in mountainous regions with an average road grade of 4%. These measurements were obtained using a Portable Emission Measurement System (PEMS) monitoring a sample of 15 buses during eight months of daily operation. For a city with a high level of vehicular traffic (Mexico City), we obtained an average fuel consumption of 0.41 L/km and emission factors of 965.8, 41.4, and 5.3 g/km for CO₂, CO, and NO_x, respectively. Fuel consumption and CO₂ emissions were within expected values. However, CO emissions were approximately three times higher while the NO_x emissions were half of the reported values in the literature for buses of similar technology working at low altitude.

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