

On Board Measurement of Real Exhaust Emission of Light-Duty Vehicles in Algeria

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Abstract : The study presents an analysis of the Algerian vehicle fleet and resultant emissions. The emission measurement of air pollutants emitted by road transportation (CO, THC, NOX and CO₂) was conducted on 17 light duty vehicles in real traffic. This sample is representative of the Algerian light vehicles in terms of fuel quality (gasoline, diesel and liquefied petroleum gas) and the technology quality (injection system and emission control). The experimental measurement methodology of unit emission of vehicles in real traffic situation is based on the use of the mini-Constant Volume Sampler for gas sampling and a set of gas analyzers for CO₂, CO, NO_x and THC, with an instrumentation to measure kinematics, gas temperature and pressure. The apparatus is also equipped with data logging instrument and data transfer. The results were compared with the database of the European light vehicles (Artemis). It was shown that the technological injection liquefied petroleum gas (LPG) has significant impact on air pollutants emission. Therefore, with the exception of nitrogen oxide compounds, uncatalyzed LPG vehicles are more effective in reducing emissions unit of air pollutants compared to uncatalyzed gasoline vehicles. LPG performance seems to be lower under real driving conditions than expected on chassis dynamometer. On the other hand, the results show that uncatalyzed gasoline vehicles emit high levels of carbon monoxide, and nitrogen oxides. Overall, and in the absence of standards in Algeria, unit emissions are much higher than Euro 3. The enforcement of pollutant emission standard in developing countries is an important step towards introducing cleaner technology and reducing vehicular emissions.

Keywords : on-board measurements of unit emissions of CO, HC, NO_x and CO₂, light vehicles, mini-CVS, LPG-fuel, artemis, Algeria

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