

Assessment of Gasoline Adulteration in Nairobi, Kenya

Elizabeth Nyambura Mwangi Murago

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ABSTRACT

Adulteration of automotive gasoline is widespread throughout the world and Kenya is no exception. Adulteration takes its toll both in terms of the air pollution and loss in tax revenue. Increase in prices of fuels and fuel intermediates is often cited as a cause for adulteration. Adulterated fuels deprive the consumers of assured quality fuels thus leads to increased tail pipe emissions of hydrocarbons (HCs), carbon monoxide (CO), oxides of nitrogen (NO_x), particulate matter (PM) and emissions of air toxins such as benzene, methylbenzene and polyaromatic hydrocarbons which are well known carcinogenic compounds. Many conventional methods have been used to test for adulteration such as use of the fuel marker, which has not been effective in cases where visible dyes are used. This study set out to assess the adulteration of automotive gasoline in Nairobi, Kenya using FTIR spectroscopy. The results obtained by FTIR showed that the adulteration ranged from 7.825 ± 1.275 % to 17.464 ± 0.574 % and the results suggested that adulteration was done at central areas like in the storage tanks before distribution to retailers or at retailer points. The results obtained for sulphur for a few samples showed that there was a possibility of adulteration with solvents with high level of sulphur like kerosene and diesel. A few samples of unleaded gasoline were analyzed for the presence of lead. The results obtained indicated that there was lead present in the gasoline but did not surpass the level set by the Kenya bureau of standards an indication that the effect of lead to the environment is far from addressed. From this study, a new method was developed that was rapid, had high sample through put requiring minimal time and a small amount of sample for analysis.