

# Effect of Biowaste Materials on the Physical Properties of Blended Fuel for Industrial Application

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## Abstract:

In this study, PMS gasoline gotten from randomly selected commercial fuel stations was blended with ethanol gotten from agricultural waste and developed nanoparticles Additives (D-NA). The blended samples were analyzed for their physical properties using methods recommended by the American Society for Testing and Materials (ASTM). The tests were carried out on the fuel's density, oxygenates, benzene content, research octane number (RON) and sulphur content. The results shown in the physical property tests done on these blended fuels when compared with the neat gasoline gotten from the Nigerian National Petroleum Corporation (NNPC), industry standards (DPR/SON) and global markets (United States US & United Kingdom UK) shows that the blended fuels meet all required standards and specifications. The additives had little effect on the fuel's density but showed a sharp drop in its benzene content levels which makes it a healthier choice of fuel. Ethanol blended fuel had a higher oxygenate level than neat gasoline and the D-NA blended fuel. The research octane number for the three fuel samples showed favorably high numbers that fit the standards of the global market. The most interesting result is the Sulphur content which showed an increase in its values for the blended fuels although the values are within industrial and global limits.

Keywords: PMS Fuel; physical properties; density; oxygenates; nanoadditives; ethanol