Abstract

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Determination of the heating value of coconut shell based fuel for low melting metals.

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Abstract

Our current primary energy consumption depends on oil. Renewable energy sources such as biomass, biofuel, wind, hydro, geothermal and solar are mainly used for power generation. In summary, global primary energy consumption has increased since the onset of the 20th century, propelled by economic development and the growth of population. Fossil fuels (oil, natural gas, and coal) contribute over 80% of this consumption. The world is becoming less dependent on fossil fuel hence, the development and utilization of renewable energies that add very low CO2 to the environment are being encouraged. This has necessitated the search for alternative fuel sources to supplement the use of fossil fuel. Large quantities of coconut shell obtained from the cracking of coconut palm often get wasted and this creates a nuisance in the environment. The usual practice is to dispose of the shell after cracking the coconut palm, but this method of disposal causes environmental/ ecological hazard to the community. Over the years, different waste management treatment, and disposal methods have been used other than the traditional method. Particular attention now focuses on technologies, which recycle waste as fuel to generate energy with little or negligible negative environmental implication on the eco-system, one of such technologies is the use of coconut shell as fuel. Therefore, any effort at upgrading its useful value would contribute to the energy requirement of the producing and processing industry. According to Food and Agricultural Organization (FAO) estimates, the cultivation of coconut has been expanding, although an estimate of 70% of all coconut production is taken by the domestic market, while one-third of the production is consumed as a fresh product. The utilization of coconut shells as a source of heat energy was investigated as an alternative source of energy. Disposed coconut shells obtained locally were used. The coconut shells were placed in the moisture extraction oven at exactly 50oC within 24 to determine the moisture content and afterward heated in a closed furnace (test-rig) to completely melt the metals (Lead-Pb, Aluminium-Al). The average moisture content and gross heating value of the coconut shells were 6.67 % and 19.83 MJ/ Kg respectively; the product of the combustion was ash. Coconut shells give low moisture, high heating value, low ash, and low CO2.

Biography

Nsidibe Sunday is a Mechanical/ Petroleum engineer with extensive experience in HVAC systems, Business Development, Core/ PVT analysis, and Data Management. He specializes in the areas of Flow Assurance issues, Multiphase Flow, Heat Management Systems, thermal and hydrodynamic analysis, and Numerical Modelling. He has B.Sc. in Mechanical Engineering from the Obafemi Awolowo University Ile-Ife, Osun State. PGD in Petroleum Technology and Masters in Petroleum Engineering and Project Development both at the Institute of Petroleum Studies (IPS), Nigeria/ Institute Français du Pétrole (IFP School) France.

