Biofuels and biolubricants production for industrial application: Sudanese experience

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There has been a steady increase in the demand for environmentally friendly fuel; nearly 90% of the world’s energy demand is met by the consumption of non-renewable fossil fuels. Due to the increasing energy demand throughout the world, the oil reserves are expected to last many years less than the projections made earlier. This coupled with the contribution of fossil fuels combustion to global warming and increasing mineral oil prices, has given momentum to the exploitation of renewal sources of energy, the production of biodiesel through transesterification of vegetable oils and animal fats being one of them. Also the fermentation of biomass byproducts for the production of alcohols and the production of bio lubricants from non-edible oil and fats got more attention by number investigators. Sudan as an agricultural country with high population of animal livestock is an excellent candidate for the production of biofuels and biolubricants. Research work; in Sudan, on converting the huge biomass byproducts into useful biofuels and biolubricants was started by the end of the last century. It was started as small academic research and then immerged into a national campaign. The production of ethanol by yeast is well-established technology. In order to produce a fuel gasoline-ethanol blend is a fuel consisting primarily of gasoline along with a substantial amount of fuel ethanol. Biodiesel is defined as the mono-alkyl esters of fatty acids derived from vegetable oils or animal fats, in simple terms, biodiesel is the product you get when a vegetable oil or animal fat is chemically reacted with an alcohol to produce a fatty acid alkyl ester. Number of biomass byproducts types and non-edible oil seeds were used for the production of biofuels; i.e., Jatropha curcas oil, Roselle oil seeds, cotton seeds oil beside different types of spent frying oils. These different raw materials been treated and excellent results were obtained. High biodiesel yield (92.7 w/w%) from J. curcas oil (FFA<2%) was produced using one-step alkali based catalyzed transesterification. Beside was the production of the biolubricants using Sudanese castor seed oil.

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