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Co-processing of petroleum vacuum residue with Jatropha oil, plastics, coal and bagasse

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Abstract

Petroleum reserves of the world are limited. Therefore, a shift to renewable energy sources is inevitable. However, there could be the technological problems in an abrupt shift to the renewable energy sources such as Biofuels. These problems may be overcome through further work. However, there would be an immediate need for the technological intervention during the transition period. The research group of the author has been extending research work on the development of processes for the coprocessing of petroleum vacuum residue with coal, plastics (thermoplastics as well as thermosets), agroresidues (bagesse), petrocrop (*Calotropis procera*). Synergism in some of the co-cracking/ copyrolysis reactions was reported by the authors research group. The oil and gaseous products obtained in the several cracking reactions were characterized. The use of different catalysts in the cracking and co-cracking reactions was also made. Kinetic and thermodynamics studies on some of the reactions were reported. In fact, coprocessing of biomass with other fuels such as coal, plastics, petroleum vacuum residues etc may provide cleaner and efficient fungible fuels during the transition period before the complete shift to the biomass conversion technologies. These studies may help in understanding the mechanism of the process and in the process engineering and process intensification such as reactor modeling and reactor design. The continuous processes using catalytic fluidized bed reactors on the same lines as the fluidized catalytic cracking reactors may be developed in future. An update on the research work in these directions would be presented.