

Thermal - decomposition and conversion of plastic waste to diesel fuel

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Plastic waste materials were thermally converted to diesel fuel, using a self- fabricated pyrolysis reactor. This investigation was carried as a means of energy recovery and provision of feed stock for both, domestic and industrial applications. Enormous demand, production, utilization, and non-degradability of plastic waste materials, had resulted into their accumulation in the environment, posing great threat to the life of both flora and fauna. The pyrolysis reactor used in this research consists of large incineration chamber, feed hopper, condenser, thermostat to regulate the operational temperature. The percentage yield of PDWF was 30.78%, the viscosity was 2.9 Pa.s using ASTM D445 specification. The flash point (73°C), flammability of 185°C, specific gravity, and ash content of 0.11%, all compared favorably to the commercial (OMEGA) diesel fuel grade. The distillation temperature for plastic waste to diesel fuel (PWDF) was determined at 185°C. The quality control parameters carried out on PDWF confirmed it as an alternative source of energy, suitable for diesel engines and a means of plastic waste management.