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# LOCAL PLASTIC WASTE VALORIZATION POTENTIAL: FUEL CONVERSION AND CHARACTERISATION

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## PURPOSE OF THE ABSTRACT

Plastics generally play a very important role in a plethora of industries, fields and our everyday lives. In spite of their cheapness, availability and important contributions to lives, they however, pose a serious threat to the environment due to their mostly non-biodegradable nature. Recycling into useful products can reduce the amount of plastic waste. Thermal degradation (Pyrolysis) of plastics is becoming an increasingly important recycling method for the conversion of plastic materials into valuable chemicals and oil products.

In this work, waste Polyethylene terephthalate (PET) water bottles were thermally converted into useful gaseous and liquid products. A simple pyrolysis reactor system has been used for the conversions with the liquid product yield of 65 % at a temperature range of 400°C to550°C. The resultant products have been analysed via GCMS, FTIR, and GC.

A simple pyrolysis reactor system has been used for the conversions with the liquid product yield of 65 % at a temperature range of 400°C to550°C. The chemical analysis of the PET pyrolytic oil showed the presence of functional groups such as alkanes, alkenes, alcohols, ethers, carboxylic acids, esters, and phenyl ring substitution bands. The composition of the pyrolytic oil was analyzed using GC-MS, and it was found that the main constituents were 1-Tetradecene, 1-Pentadecene, Cetene, Hexadecane, 1-Heptadecene, Heptadecane, Octadecane, Nonadecane, Eicosane, Tetratetracontane, 1-Undecene, 1-Decene). The physical properties of the obtained pyrolytic oil were close to those of mixture of petroleum products.

The physical properties of the obtained pyrolytic oil were close to those of mixture of petroleum products. The results are promising and can be maximized by additional techniques such as hydrogenation and hydrodeoxygenation to obtain value-added products. This pyrolysis approach provides a promising route to help solve the problem of environmental pollution caused by waste polymeric materials and providing alternative energy needs.

## FIGURES

FIGURE 1

FIGURE 2


## KEYWORDS

Pyrolysis | Municipal Solid waste | Alternate Fuel | Thermochemical Conversion


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