

Thermal and catalytic pyrolysis of waste plastic heavy distillate into diesel-like product

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1. General Introduction

This dataset contains data collected during thermal and catalytic pyrolysis of waste plastic heavy distillate (HD) into diesel-like product experiments at Moi University, as part of Jasper Okino's MSc thesis project, available at:

http://ir.mu.ac.ke:8080/xmlui/bitstream/handle/123456789/8804/Okino_Jasper_Thesis_2023.pdf?isAllowed=y&sequence=1 . The research is being made public both to act as supplementary data for publications and MSc thesis of Jasper Okino and for other researchers to use the data in their own work.

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The HD sample was obtained from a plastic recycling factory owned by Alternative Energy Systems Limited (AESL) located in Thika Municipality, Kenya. Kaolin clay was used as a catalyst for this study and the clay was obtained from Eburru Hill, Nakuru County (Kenya).

2. Purpose of the experiments

The purpose of the experiments was to investigate the production of diesel-like product from waste plastic Heavy Distillate with and without kaolin catalyst using reaction temperature, heating time and catalyst ratio as selected process parameters.

3. Test equipment

The kaolin placed in the electric oven (model: LDO-I 50F LabTech, DAIHAN LABTECH CO. Ltd, South Korea). Clay powder was analyzed using a Bruker SI Titan 600 handheld XRF

Analyzer (Bruker Nano Analytics, Berlin, Germany) for chemical compositions. The heating source used was a locally made modified brick electric furnace.

4. Description of the data in this dataset

The data included in this dataset was organized in zip folder and contains three files described as follow:

1. Excel file named “Cat_Ther__Expt.xlsx”: this file contains experimental data for two different experiments recorded in two 2 different tables:
 - a) Table 1: Experimental Data of Thermal Pyrolysis of Heavy Distillate
 - b) Table 2: Experimental Data of Catalytic Pyrolysis of Heavy Distillate
2. Excel file named “Monitoring Oil Yield During Thermal and Catalytic Pyrolysis.xlsx”: this file contains two sheets for monitoring oil yield during thermal and catalytic pyrolysis:
 - a) Sheet 1 for Thermal monitoring
 - b) Sheet 2 for Catalytic monitoring
3. Pdf file named “XRF Analysis”: this pdf document contains recorded experimental data for of clay powder chemical compositions, analyzed using a Bruker SI Titan 600 handheld XRF Analyzer (Bruker Nano Analytics, Berlin, Germany). The percentage of kaolin were analyzed, and then recorded.

4. Sharing and Access information

CC BY-NC-ND 4.0: This is an open access dataset under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).