

**THERMAL BEHAVIOUR STUDY OF MALAYSIAN BITUMINOUS COAL
AND REFUSE DERIVED FUEL BLENDS BY PYROLYSIS VIA
THERMOGRAVIMETRIC ANALYSIS**



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ABSTRACT

The purpose of this study is to investigate the thermal behaviour of Malaysian bituminous coal and refuse derived fuel blends by pyrolysis via thermogravimetric analysis. The experiment is performed in Universiti Teknologi MARA Malaysia laboratory. Investigations into pyrolytic behaviour during co-pyrolysis of coal, RDF and coal/RDF blends prepared at different ratios (100:0, 70:30, 50:50, 30:70 and 0:100) has been conducted using thermogravimetric analysis (TGA) apparatus. However, elemental analyzer and bomb calorimeter also been used in order to determine the composition (C, H, N, O and S) and calorific value of the sample respectively. The coal sample selected was Silantek bituminous coal from Malaysia while Refuse Derived Fuel was used as biomass sample. Two thermal events were identified during pyrolysis. The first one is released of remaining moisture in the samples and the second one is released of volatile matter of the samples which occur at high temperature. During pyrolysis, there is no interaction between coal and biomass since pyrolytic characteristic of the blends followed those parent fuels in additives manner. The best heating rate for this study was 60 °C/min and the optimum blend ratio for pyrolysis of coal/RDF was 50:50 with high degradation rate in all thermal events. From the result obtained, it can provide useful data for power generation industries for the development of co-firing options with biomass.

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