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## Thermokinetic analysis and product characterization of Medium Density Fiberboard pyrolysis

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### Abstract

This study investigates the pyrolysis of Medium Density Fiberboard (MDF) as a potential waste management solution. Thermal behaviour of MDF was analysed via TG/DSC. The primary decomposition step occurred between 190°C and 425°C. Evolved gaseous products over this step were evaluated by a FTIR spectrometer coupled with TGA. Peaks for phenolic, alcohols and aldehydes were detected at the maximum decomposition temperature. Py-GC/MS analysis revealed phenols, ketones and cyclic compounds as the primary non-condensable pyrolysis products. The kinetics of pyrolysis were investigated by the widely applied Distributed Activation Energy Model, resulting in an average activation energy and pre-exponential factor of 127.40 kJ mol<sup>-1</sup> and 8.4E+11. The results of this study suggest that pyrolyzing MDF could potentially provide renewable fuels and prevent environmental problems related with MDF disposal.

**Keywords:** MDF, pyrolysis, kinetics, TG/DSC-FTIR, py/GC-MS

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