Thermal analysis and computer simulation of biomass and biomass/sorbent blends for gasification purposes

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Biomass is one of the main renewable energy sources and coupled with carbon dioxide adsorbent material such as calcium oxide sorbent it increases the biomass conversion efficiency during gasification. This study aims to investigate the thermal degradation behavior of biomass and biomass/sorbent blends. Thermal stability is the stability of the material to resist change in physical shape as its temperature change. Thermogravimetric analysis (TGA) was employed to determine the thermal stability of biomass and sorbent mixtures of pine-wood, calcium oxide (CaO) and or magnesium oxide (MgO), which will ultimately determine the gasification characteristics of the blends. The simulation software developed by Jayah et al, 2003 was used for the determination of the conversion efficiency of the materials. A mixture resulted in the highest thermal stability and conversion efficiency compared to others will be the one suitable for gasification.

Biography

Mabuda A. I is a Ph.D. student at the University of Fort Hare, South Africa. She obtained her B.Sc degree in Physics from the University of Venda and B.Sc honors and MSc (Physics) at the University of the Western Cape, South Africa. She has published two papers in the conference proceedings and submitted three papers to the journals for publication. She is in the final stage of her Ph.D. and would like to embark on a Post-doctoral degree in 2014.

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