Kinetic parameter estimation for drying stage during gasification of empty fruit bunch

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ABSTRACT
This paper presents kinetic parameter estimation of drying stage at different heating rates for representing drying behavior of empty fruit bunch (EFB) during gasification process. Kinetic constants based on Arrhenius law were estimated by using least-squares method by employing from thermogravimetric analysis data. The results show activation energy estimated are 14.53, 21.12 and 18.82 kJ/mol and pre-exponential factor estimated are 8.74, 236.37 and 275.36 min-1 for 10, 20 and 50 °C/min heating rates. The kinetic constants show good fit with experimental data where standard deviation lesser than 0.05 and R2 values above 0.98 are obtained indicating drying model is reliable to be used for designing biomass gasification.

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