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Abstract

This study introduces an improved computational procedure to determine the thermal degradation of biomasses when submitted to a torrefaction process. The novelty consists in integrating a *summative* kinetic model approach with an enhanced *finite difference* scheme. This is achieved by defining timing updated parameters to account for both the extent of conversion and the evolution of the fibers composition. As main result, the proposed method enhances the exploitation of the *summative* assumption considering that the predictive accuracy of the model sets within 5% as maximum error. Furthermore, the adopted discrete approach contributes to generalize the TGA set up going beyond the conventional heating programs usually limited to isothermal and constant heating rate constrains. Due to these constitutive improvements, the proposed computational approach looks promising for investigations involving both kinetic analysis and thermal processes design including torrefaction.

Keywords: Biomass, Kinetic, Model, Torrefaction

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