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Prediction of higher heating values of combustible solid wastes by pseudo-components and thermal mass coefficients

Qinghai Li[a,b], Yanqiu Long[a,b], Hui Zhou[c], Aihong Meng[a,b], Zhongchao Tan[a,d], Yanguo Zhang[a,b*1]

[a]*Key Laboratory for Thermal Science and Power Engineering of Ministry of Education, Department of Thermal Engineering, Tsinghua University, Beijng, 100084, P. R. China*

[b]*Beijing Key Laboratory for CO_2 Utilization and Reduction Technology, Department of Thermal Engineering, Tsinghua University, Beijing 100084, China*

[c]*Department of Earth and Environmental Engineering, Columbia University, New York, NY 10027, USA*

[d]*Department of Mechanical and Mechatronics Engineering, University of Waterloo, Ontario, Canada N2L 3G1*

Highlights

- A method for predicting the higher heating values was proposed.
- The method is based on the pseudo-components and thermogravimetric analysis.
- Thermal mass coefficients are calculated from TG curves.
- The higher heating values are obtained by weighted average.

Abstract

A method was developed for the prediction of the higher heating values (HHVs) of combustible solid wastes (CSWs) by considering the thermal mass coefficients and the HHVs of pseudo-components. The pseudo-components include cellulose, hemicellulose, lignin, and starch for biomass based CSWs, and PE, PVC, PP, PS and PET for plastic CSWs. The thermal mass coefficients of the pseudo-components were determined by thermal gravimetric analysis (TGA). The TGA curves were used to determine the corresponding thermal mass coefficients by linear regression. The proposed model was also validated by experiments using 49 types of CSWs.

*Corresponding author. Tel.: +86 10 62783373.

E-mail addresses: zhangyg@tsinghsua.edu.cn (YG Zhang).