

Accepted Manuscript

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

Authors: Qinghai Li, Yanqiu Long, Hui Zhou, Aihong Meng, Zhongchao Tan, Yanguo Zhang



PII: S0040-6031(17)30268-X
DOI: <https://doi.org/10.1016/j.tca.2017.10.013>
Reference: TCA 77855

To appear in: *Thermochimica Acta*

Received date: 17-6-2017
Revised date: 5-9-2017
Accepted date: 16-10-2017

Please cite this article as: Qinghai Li, Yanqiu Long, Hui Zhou, Aihong Meng, Zhongchao Tan, Yanguo Zhang, Prediction of higher heating values of combustible solid wastes by pseudo-components and thermal mass coefficients, Thermochimica Acta <https://doi.org/10.1016/j.tca.2017.10.013>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

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}

^aKey Laboratory for Thermal Science and Power Engineering of Ministry of Education, Department of Thermal Engineering, Tsinghua University, Beijing, 100084, P. R. China

^bBeijing Key Laboratory for CO₂ Utilization and Reduction Technology, Department of Thermal Engineering, Tsinghua University, Beijing 100084, China

^cDepartment of Earth and Environmental Engineering, Columbia University, New York, NY 10027, USA

^dDepartment 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).

Download English Version:

<https://daneshyari.com/en/article/7062124>

Download Persian Version:

<https://daneshyari.com/article/7062124>

[Daneshyari.com](https://daneshyari.com)