

# Accepted Manuscript

Research Paper

Experimental investigation of ash deposition behaviour modification of straws by lignite addition

Fenghai Li, Meng Li, Huimin Zhao, Yitian Fang

PII: S1359-4311(17)31270-X

DOI: <http://dx.doi.org/10.1016/j.applthermaleng.2017.06.144>

Reference: ATE 10664

To appear in: *Applied Thermal Engineering*

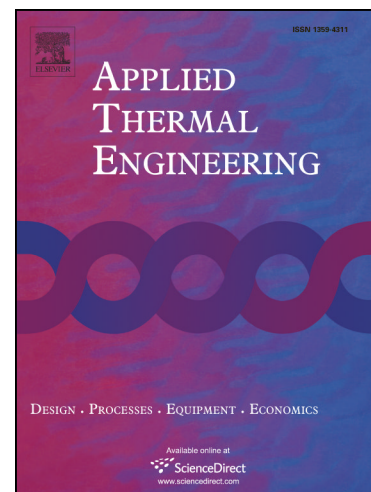
Received Date: 23 February 2017

Revised Date: 28 June 2017

Accepted Date: 29 June 2017

Please cite this article as: F. Li, M. Li, H. Zhao, Y. Fang, Experimental investigation of ash deposition behaviour modification of straws by lignite addition, *Applied Thermal Engineering* (2017), doi: <http://dx.doi.org/10.1016/j.applthermaleng.2017.06.144>

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.



# Experimental investigation of ash deposition behaviour modification of straws by lignite addition

Fenghai Li<sup>a,b,c,\*</sup>, Meng Li<sup>b</sup>, Huimin Zhao<sup>a</sup>, Yitian Fang<sup>c</sup>

<sup>a</sup> *Department of Chemistry and Chemical Engineering, Heze University, Heze, 274000, China*

<sup>b</sup> *College of Chemistry and Chemical Engineering, Henan Polytechnic University, Jiaozuo 454003, China*

<sup>c</sup> *State Key Laboratory of Coal Conversion, Institute of Coal Chemistry, Chinese Academy of Sciences, Taiyuan, 030001, China*

**ABSTRACT:** The ash-deposition (AD) characteristics of straws (corn stalk [CS], wheat straw [WS], cotton stems [CCS], and soybean stalk [SS]), and the effects of lignite (Husheng [HS], Huolinhe [HLH]) on the characteristics were investigated. Under the same conditions, the AD mass ratio ( $M_{ad}$ ) decreases as  $WS > CS > CCS > SS$ , and the  $M_{ad}$  of the four straws decreases more obviously with HS addition than that for HLH addition. The  $M_{ad}$  of SS and CSS increases slowly before 1000°C and then increases rapidly; whereas for CS and WS, the change occurs at 950°C. The differences result mostly from the higher potassium-oxide contents in CS (26.34%) and WS (30.04%) over those in CCS (11.63%) and SS (10.25%).  $Ca^{2+}$  replaces  $K^{+}$  in semi-molten alumino-silicate (orthoclase and leucite) and results in the formation of a high melting-point anorthite. This, together with the generation of high melting-point mullite, leads to a decrease in  $M_{ad}$  of the mixed ashes with an increase in lignite mass ratio. The position changes of the ash composition in the ternary phase diagrams and their variation in liquid-phase content with increasing temperature based on the FactSage software calculation may explain the variation in  $M_{ad}$ .

**Keywords:** Ash-deposition characteristics; Straw; Lignite; Modification mechanism

---

\*Corresponding author

E-mail addresses: hzlfh@163.com (F. Li); fyt@sxicc.ac.cn (Y. Fang).

Download English Version:

<https://daneshyari.com/en/article/4991173>

Download Persian Version:

<https://daneshyari.com/article/4991173>

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