

# Accepted Manuscript

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PII: S0360-5442(17)30054-3

DOI: [10.1016/j.energy.2017.01.054](https://doi.org/10.1016/j.energy.2017.01.054)

Reference: EGY 10189

To appear in: *Energy*

Received Date: 25 August 2016

Revised Date: 20 December 2016

Accepted Date: 9 January 2017

Please cite this article as: Chen NN, Chen MQ, Fu BA, Song JJ, Far-infrared irradiation drying behavior of typical biomass briquettes, *Energy* (2017), doi: 10.1016/j.energy.2017.01.054.

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## Far-infrared irradiation drying behavior of typical biomass briquettes

N.N. Chen<sup>a,b</sup>, M.Q. Chen<sup>a,b\*</sup>, B.A. Fu<sup>a,b</sup>, J.J. Song<sup>c</sup>

<sup>a</sup>Institute of Thermal Engineering, School of Mechanical, Electronic and Control Engineering, Beijing Jiaotong University, Beijing 100044, China

<sup>b</sup>Beijing Key Laboratory of Flow and Heat Transfer of Phase Changing in Micro and Small Scale, Beijing 100044, China

<sup>c</sup>Guohua Electric Power Branch, China Shenhua Energy Company Limited, Beijing 100025, China

**Abstract:** Infrared radiation drying behaviors of four typical biomass briquettes (populus tomentosa leaves, cotton stalk, spent coffee grounds and eucalyptus bark) were investigated based on a lab-scale setup. The effect of radiation source temperatures (100-200 °C) on the far-infrared drying kinetics and heat transfer of the samples was addressed. As the temperature went up from 100 °C to 200 °C, the times for the four biomass briquettes decreased by about 59-66 %, and the average values of temperature for the four biomass briquettes increased by about 33-39 °C, while the average radiation heat transfer fluxes increased by about 3.3 times (3.7 times only for the leaves). The specific energy consumptions were 0.622-0.849 kW h kg<sup>-1</sup>. The Modified Midilli model had the better representing for the moisture ratio change of the briquettes. The values of the activation energy for the briquettes in the first falling rate stage were between 20.35 and 24.83 kJ mol<sup>-1</sup>, while those in the second falling rate stage were between 17.89 and 21.93 kJ mol<sup>-1</sup>. The activation energy for the eucalyptus bark briquette in two falling rate stages was the least one, and that for the

\*Corresponding author. Tel.: +86 10 51683423  
E-mail address: [mqchen@bjtu.edu.cn](mailto:mqchen@bjtu.edu.cn) (M.Q. Chen).

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