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Co-gasification of bituminous coal and hydrochar derived from municipal solid waste: Reactivity and synergy

Juntao Wei^a, Qinghua Guo^a, Qing He^a, Lu Ding^b, Kunio Yoshikawa^b, Guangsuo Yu^{a,*}

^a Key Laboratory of Coal Gasification and Energy Chemical Engineering of Ministry of Education,

East China University of Science and Technology, Shanghai 200237, PR China

^b Department of Environmental Science and Technology, Tokyo Institute of Technology, 4259

Nagatsuta-cho, Midori-ku, Yokohama 226-8503, Japan

Abstract: In this work, the influences of gasification temperature and blended ratio on co-gasification reactivity and synergy of Shenfu bituminous coal (SF) and municipal solid waste-derived hydrochar (HTC) were investigated using TGA. Additionally, active alkaline and alkaline earth metal (AAEM) transformation during co-gasification was quantitatively analyzed by inductively coupled plasma optical emission spectrometer for correlating synergy on co-gasification reactivity. The results showed that higher char gasification reactivity existed at higher HTC char proportion and gasification temperature, and the main synergy behaviour on co-gasification reactivity was performed as synergistic effect. Enhanced synergistic effect at lower temperature was mainly resulted from more obviously inhibiting the primary AAEM (i.e. active Ca) transformation, and weak synergistic effect still existed at higher temperature since more active K with prominent catalysis was retained. Furthermore, more active HTC-derived AAEM remaining in SF sample

* Corresponding Authors. Tel.: +86-21-64252974, Fax: +86-21-64251312.

E-mail address: gsyu@ecust.edu.cn (G. S. Yu).

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