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Synergistic effect on co-gasification reactivity of biomass-petroleum coke blended char

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Abstract: In this work, effects of gasification temperature (900°C-1100°C) and blended ratio (3:1, 1:1, 1:3) on reactivity of petroleum coke and biomass co-gasification were studied in TGA. Quantification analysis of active AAEM transformation and in-situ investigation of morphological structure variations in gasification were conducted respectively using inductively coupled plasma optical emission spectrometer and heating stage microscope to explore synergistic effect on co-gasification reactivity. The results indicated that char gasification reactivity was enhanced with increasing biomass proportion and gasification temperature. Synergistic effect on co-gasification reactivity was presented after complete generation of biomass ash, and gradually weakened with increasing temperature from 1000°C to 1100°C after reaching the most significant value at 1000°C. This phenomenon was well related with the appearance of molten biomass ash rich in glassy state potassium and the weakest inhibition effect on active

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