

عنوان مقاله:

Catalytic Effect of Metal Species on Enhancement of CO₂ Gasification Reactivity of Biomass Char

محل انتشار:

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خلاصه مقاله:

In the Boudouard reaction, where CO₂ is reacted with carbon (char) to produce CO, very high temperatures are required to shift the equilibrium towards CO production. This endothermic reaction is inherently slow and catalytic species are effective to speed up the reaction rate at temperatures below 900 °C. In this study, the catalytic effect of some alkali (K, Na), alkaline earth (Ca) and transition (Fe) metals on enhancing the CO₂ gasification reactivity of pistachio shell (PS) char was investigated. The CO₂ gasification studies were performed in a Thermogravimetric analyzer (TGA). Among the examined potassium species, K₂CO₃ showed the highest catalytic effect; wherein, complete carbon conversion was achieved 48.1% faster as compared to un-catalyzed PS char. The highest catalytic effect among the sodium salts was devoted to NaNO₃ which showed 57.7% enhancement in the reactivity of char. CaCl₂ and Fe(NO₃)₂ also showed the best catalytic performance among the examined calcium and iron species and improved the reaction rate by 64.6 and 46.1%, respectively.

کلمات کلیدی:

, CO₂ gasification , Biomass Char , Catalyst , Boudouard Reaction

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