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神华煤直接液化残渣萃取残渣焦气化动力学研究

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Gasification kinetics of extraction residue char from Shenhua direct liquefaction residue

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摘要 在热天平上分别考察了甲苯、苯及乙醇萃取液化残渣热解焦在水蒸气和CO_2气氛下的气化动力学,并对比了液化残渣热解焦在相同条件下的气化反应性。结果表明,温度是影响残渣焦气化反应速率的重要因素;超临界溶剂对残渣的萃取使得残渣焦中碳基质的有序度有所降低,并在一定程度上增加了残渣焦的孔结构,因此,提高了残渣焦的气化反应性;残渣焦孔结构不发达,可以使用化学反应控制未反应收缩核模型预测残渣焦的气化反应过程。

关键词: 液化残渣 萃取残渣 水蒸气气化 CO_2气化 动力学

Abstract: Thermo-gravimetric analysis was employed to study gasification kinetics of three coal direct liquefaction extract residue chars under steam and CO_2 atmosphere. Gasification kinetics of liquefaction residue char was compared at the same conditions. It is shown that temperature plays a significant role on residue char gasification. The decreasing degree of order for carbon and increasing pore structure in residue chars due to supercritical solvent extraction improve gasification reactivity of residue chars. Due to the lack of pore structure, the experimental results of residue chars during steam gasification and CO_2 gasification can be well described by the chemical reaction control shrinking core model.

Key words: liquefaction residue extract residue steam gasification CO_2 gasification dynamic kinetics

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