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工程热物理

气流床固态排渣实验研究

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摘要：

煤气化技术由于其高煤炭利用率和低污染排放，近年来得到快速发展。为扩大该技术对高灰熔点煤种的适应性，在0.5 kg/h规模的常压富氧气流床气化实验系统上，对我国高、低灰熔点煤在固态排渣温度范围内进行了煤粉富氧气化特性实验研究。研究结果表明：随着温度的升高，有效气浓度增大，碳转化率增大，冷煤气效率增大，灰渣熔融程度增强；随着氧碳比的升高，有效气浓度降低，碳转化率升高；随着停留时间的增大，有效气浓度、碳转化率和冷煤气效率都升高，灰熔融特性更加显著。不同煤种在相同条件下，灰熔融特性也不相同，低灰熔点褐煤在1300℃、停留时间为1.5 s时，灰熔融特性比高灰熔点烟煤明显。

关键词： 富氧气化 气流床 气化特性 高灰熔点煤 灰熔融性

Experiment Study on Solid Slag in an Entrained Flow Coal Gasifier

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Abstract: The technology of coal gasification has been developed rapidly in recent years for its high usage of coal and low pollution emission. For increasing its applicability to high ash fusion coal, experimental studies on oxygen-enriched gasification characteristics of both high and low fusing temperature coal with 0.5 kg/h ordinary pressure entrained-flow gasification system was carried out. Four important results were discovered: the concentration of effective gas, the rate of carbon conversion and the efficiency of cooled coal gas all increase as increasing of temperature, and the fusing characteristics of ash slag are enhanced; With increasing of [O]/[C], the concentration of effective gas reduces whereas the rate of carbon conversion increases; When the reaction time is increased, all three parameters presented above increase and the fusing characteristics are enhanced more markedly; In addition, different coals have different fusing characteristics even under the same conditions. Ash fusing characteristic of lignite is intensified compared with that of bituminous under the temperature of 1300℃ when the reaction time is 1.5 s.

Keywords: rich oxygen gasification entrained flow bed gasification character high ash slag fusibility coal ash slag fusibility

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