

### 橄榄石基固体热载体影响褐煤热解产物分布的分析

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### Product distribution of lignite pyrolysis with olivine-based solid heat carrier

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**摘要** 为了提高固体热载体煤热解工艺中焦油的品质,降低焦油中沸点大于360 °C的重质组分含量,本实验采用固定床反应器,在450~600 °C下进行褐煤固体热载体快速热解反应.分析对比了橄榄石基和石英砂固体热载体对褐煤热解产物收率、焦油馏分、气体组成的影响.结果发现,Co能改变煤内部挥发分氢元素的分布,橄榄石负载Co热载体能将焦油中重质组分转化为轻质焦油和热解气.热解温度为550 °C时,与橄榄石相比,负载Co的橄榄石固体热载体使焦油收率提高了19.2%.与石英砂相比,负载Co的橄榄石固体热载体使焦油中重质组分含量降低了17.0%,轻质组分收率达5.1%,其中,轻油、酚油和萘油分别提高了19.6%、17%和15.2%,气体产物中H<sub>2</sub>、CH<sub>4</sub>含量下降.

**关键词:** 褐煤 快速热解 固体热载体 橄榄石 钴

**Abstract:** To improve the quality of tar, and reduce the heavy fraction (whose boiling points are greater than 360 °C) in the tar, the lignite fast pyrolysis process using olivine and Co-impregnated olivine (Co/olivine) as the solid heat carrier was investigated in a fixed bed reactor over the temperature range 450~600 °C. The effects of olivine and Co/olivine on the product yield, gas composition and tar fraction were examined. The results show that Co/olivine leads to a decrease in heavy oil fraction content, but an increase in tar yield. Co/olivine makes an increase in tar yield by 19.2% compared to the silica sand, while a decrease in heavy oil fraction content by 17.0% compared to the olivine at 550 °C. The yield of light oil can reach up to 5.1%, however, the content of light oil, phenol oil and naphthalene oil increases by 19.6%, 17% and 15.2%, respectively. Meanwhile, the content of H<sub>2</sub> and CH<sub>4</sub> in gaseous product is obviously decreased.

**Key words:** lignite fast pyrolysis solid heat carrier olivine cobalt

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










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