

神府煤煤岩显微组分的浮选分离及富集物的低温热解产物特性研究

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Flotation separation of Shenfu coal macerals and low temperature pyrolysis characteristics of different maceral concentrate

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摘要 研究了神府煤煤岩显微组分的浮选法分离及富集物的低温热解产物特性, 考察了矿浆pH值对浮选分离效果的影响, 探讨了显微组分富集率对低温热解产物收率的影响, 对比分析了显微组分富集物低温热解产物特性, 为煤岩显微组分的分级利用提供理论指导。结果表明, 调节矿浆pH值可控制煤岩显微组分的分离效果; 煤样中镜质组含量越高, 低温热解的焦油收率越高, 而惰质组含量越高, 焦油收率越低, 半焦收率越高; 镜质组富集物低温热解后半焦表面出现明显的大孔和裂隙, 惰质组富集物低温热解后半焦的结构更加疏松、易碎, 小颗粒增多; 神府煤及各显微组分富集物低温热解焦油中酚类物质的相对含量较高, 镜质组富集物热解焦油中的酚类、萘类和链烃类物质含量高于惰质组, 而惰质组富集物焦油中多环芳烃类及苯类相对含量较高; 神府煤及各显微组分富集物低温热解气的主要成分为CH₄、H₂、CO、CO₂及少量C₂₋₅碳氢物, 镜质组富集物热解气中CH₄、H₂及C₂₋₅的相对累积产率高于惰质组, 而CO和CO₂产率低于惰质组, 原煤热解气中CH₄和H₂的相对累积产率高于镜质组和惰质组。

关键词: 煤岩显微组分 浮选分离 低温热解 产物特性

Abstract: The flotation separation of Shenfu coal macerals and the low temperature pyrolysis characteristics of its concentrates were carried out. The effect of pulp pH value on flotation separation and the impact of maceral enrichment ratio on low temperature pyrolysis were studied. A contrastive analysis was conducted on the characteristics of maceral concentrates in low temperature pyrolysis, providing theory guidance for classifying utilization of coal macerals. The results show that the separation effect of macerals can be manipulated through adjustment of pulp pH value. The more vitrinite exists in the coal sample, the higher the tar yield in low temperature pyrolysis is. But the more inertinite existing in the coal sample highers the semicoke yield. The surface of semicoke from vitrinite concentrates shows clear holes and cracks, and the semicoke structure of inertinite concentrates becomes more dispersive and fragile and an increase in small particles is found. Shenfu coal and its various macerals concentrates show a relative high content of phenols in its tar from low temperature pyrolysis. More phenols, naphthalenes and hydrocarbons exist in the tar from vitrinite concentrates, whereas more cyclophanes and benzenes are found in inertinite tar. The gas compositions of Shenfu coal and its concentrates in low temperature pyrolysis are CH₄, H₂, CO₂ and a bit of C₂₋₅. The relative cumulative yield of CH₄, H₂, and C₂₋₅ in low temperature pyrolysis gas from vitrinite concentrates is higher than those from inertinite, but the CO and CO₂ is lower than that from inertinite. The relative cumulative yield of CH₄ and H₂ is higher in pyrolysis gas of Shenfu raw coal than that from vitrinite and inertinite.

Key words: coal maceral flotation separation low temperature pyrolysis characteristic of fractions

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