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神府煤与稻杆共热溶研究

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Co-thermal dissolution property of Shenfu coal and rice straw

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摘要 研究了神府煤与稻杆在1-甲基萘溶剂中不同温度下的共热溶行为。相对神府煤，稻杆单独热溶时具有更高的热溶率，表明其具有较好的热溶活性。但稻杆的热溶过程中产生大量的挥发性气体，导致其热溶率和热溶物产率之间的较大差异。神府煤单独热溶时，其热溶率与热溶物产率之间的差异相对较小。神府煤与稻杆的共热溶表明，两者之间存在协同效应，并且该协同效应受温度的影响显著。在热溶温度为320~340 ℃时，对热溶物产率而言具有正的协同效应，也即其热溶物产率的实验值大于通过神府煤与稻杆单独热溶时热溶物产率经质量加权平均计算得到的理论值。在研究的热溶温度范围内，共热溶的热溶率实验值均低于质量加权平均的理论计算值。相对于理论计算值，在320 ℃时热溶物产率的实验值增加达到最大，为7.9%。此外，通过对热溶物的性质表征，还进一步探讨了共热溶过程中的协同作用机理。

关键词： 煤 稻杆 共热溶 协同作用

Abstract： The co-thermal dissolution (CTD) properties of Shenfu coal (SC) and rice straw (RS) in 1-methylnaphthalene (1-MN) at different temperatures were studied. It is found that RS gives much higher of thermal dissolution yield (TDY), suggesting its high thermal dissolution (TD) activity. But much amount of gas is produced in the TD process of RS, resulting in the low thermal soluble yield (TSY). For the TD of SC, although the TDYs of SC are much lower than those of RS, but the differences between TDY and TSY from the TD of SC are much smaller than those from the TD of RS. CTD of SC and RS shows that there exists synergistic effect which is the function of temperature. At 320 to 340 ℃, the TSYs have positive synergistic effect. The experimental results are larger than corresponding calculated weighted mean values of the individual TD of SC and RS. While at all the TD temperatures studied, TDYs give negative synergistic effect. The largest enhancements in TSY of 7.9% comparing with corresponding calculated weighted mean values of the individual TD of SC and RS are obtained at 320 ℃. The mechanism of synergistic effect produced in CTD was discussed based on the characterization of TD soluble fractions.

Key words： coal rice straw co-thermal dissolution synergistic effect

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