

论文

基于离散单元法的筛管内煤灰颗粒通过性分析

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摘要:

基于离散单元法, 用PFC2D软件建立了煤灰颗粒通过筛管的颗粒流模型, 研究了筛管内煤灰细观颗粒的通过能力, 分析了粒间连接强度、缝径比和围压等参数对筛管内煤灰颗粒通过性的影响规律。结果表明: 随着颗粒间连接强度的增加, 通过割缝的颗粒体积线性减少; 筛管内通过割缝的颗粒体积随缝径比的增大呈增大的趋势, 同时为保证煤层结构稳定, 缝径比应小于10; 总体上讲, 穿过割缝的颗粒体积随围压的增大而增加, 但存在一定的跃升平台, 即在某一井深范围内, 煤灰颗粒通过割缝的体积量稳定。

关键词: 离散单元法; 筛管; 颗粒; 连接强度; 围压

Analysis of coal particles passing slotted screen based on discrete element method

Abstract:

On the basis of discrete element method, this paper built the particle flow model of coal particles through slotted screen with PFC2D software, presented the ability of coal micro particles through slotted screen, as well as the influence of parameters, including joint strength between particles, slot width divided by particle diameter and ambient pressure. The results show that the passed particle linearly decreases with the joint strength increasing. As the ratio of slot width divided by particle diameter going up, the passed particles increase correspondingly. And to ensure coal bed structure stable, the ratio should be less than 10. Besides, the volume increases with ambient pressure rising, yet there is certain jumped platforms, which means the volume will be stable in some depth ranges.

Keywords: discrete element method; screen pipe; particles; joint strength; ambient pressure

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