

论文

深井节理化围岩巷道破坏机理及控制技术

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摘要:

针对平顶山矿区深井巷道稳定性控制问题, 以典型节理化围岩巷道为研究对象, 采用离散元数值模拟方法研究了巷道围岩的变形破坏过程, 分析了其破坏机理, 提出了巷道围岩控制技术。研究表明: 巷道首先在拱顶、底板中央区及两侧边墙受张拉破坏, 拱肩及两侧底角受剪破坏, 破坏区范围逐渐向深部扩展直至失稳。现场实测数据表明: 在方案实施2个月后, 锚杆、锚索受力在较高值趋于恒定, 充分发挥了支护作用; 水平收敛、拱顶下沉和底臃趋于稳定, 大规模松软巷道围岩稳定性得到有效控制。

关键词: 深井; 节理化围岩; 巷道; 破坏机理; 控制技术

Roadway fracture mechanism and control technology of joint fissured surrounding rock in deep mines

Abstract:

Aimed at the stability of surrounding rock in Pingdingshan Coal Mine, took a typical deep roadway with joint fissured surrounding rock as study object, used discrete element numerical simulation, simulated the deformation and failure mechanism of surrounding rock, and the control technologies of joint fissured surrounding rock roadway were proposed. The results show that the tensile failure appears at vault and two side walls and in the middle of floor at first. Then, the shear failure appears at spandrel and two base angles. The failure zone extends into the deep area until the roadway is instable. According to the in situ monitor data, it is concluded that the stress in anchor and cable tends to be stable after supporting for two months, as well as the horizontal convergence, vault subsidence and floor heave. It means that the supporting technology works and the stability of soft surrounding rock in deep rock roadway is controlled.

Keywords: deep mine; joint fissured surrounding rock; roadway; fracture mechanism; control technology

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