

论文

注浆充填控制巨厚火成岩下动力灾害的试验研究

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摘要:

为实现海孜煤矿 II 102 采区巨厚火成岩下安全开采, 结合采区地质开采条件提出了老采空区注浆充填控制巨厚火成岩下动力灾害的技术方案。采用 UDEC 数值软件分析了老采空区注浆充填对火成岩运动及采动应力集中的控制作用。结果表明, 注浆充填可以使火成岩受到有效支撑并降低实体煤侧的应力集中状态, 同时能够控制火成岩运动并防止其突然破断。在模拟研究基础上设计了注浆充填方案。在 19 个月的施工中, 共对 6 个钻孔进行了注浆充填, 总注灰量 267 320 m³, 老采空区充填率达到 51.3%, 采空区 70% 的区域已完全承载。注浆工程实施后 II 1026 机巷掘进过程中没有再次发生动力现象, 证明该措施取得了较好的效果, 可以保证后续工作面安全回采。

关键词: 巨厚火成岩; 动力灾害; 应力集中; 注浆充填; 减灾

Field test on dynamic disaster control by grouting below extremely thick igneous rock

Abstract:

To safely extract the coal seam below the extremely thick igneous rock (ETIR) in II 102 mining area of Haizi Mine, a technical measure of controlling dynamic disaster by grouting was proposed based on geological and mining conditions of the area. A numerical simulation with Universal Distinct Element Code (UDEC) was carried out to analyze the effect of grout injecting into the mined out area on ETIR movement and stress concentration. The results show that stress concentration in the coal seam can be caused by the action of grouting mass' s bearing capacity; meanwhile, ETIR is less likely to break suddenly. A grouting scheme was put forward on the basis of simulation results. The field trail took 19 months to conduct the grouting of 6 boreholes in all. In the end, a total volume of dry flyash reached 267 320 m³. It suggested a filling ratio of 51.3% was gained and 70% of the mined out area completely carried the overburden load. The advancement of conveyor roadway of II 1026 working face resumed after the completion of grouting and the dynamic phenomenon didn' t occur again, demonstrating that grouting had conducted well and could ensure safe extraction of the following working face.

Keywords: extremely thick igneous rock; dynamic disaster; stress concentration; grouting; reducing disaster

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