

论文

沿空留巷巷内支护技术研究与应用

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摘要:

针对沿空留巷围岩变形大、变形不均匀、维护效果差等状况,以沁新矿沿空留巷为工程背景,采用数值模拟分析了巷内支护与围岩变形、应力分布的关系,揭示了沿空留巷巷内支护机理:采用高阻让压支护,提高沿空留巷围岩承载能力和抗变形能力,适应沿空留巷阶段性围岩大变形与应力调整。开发了沿空留巷巷内支护技术:①基本支护:采用高预紧力、高强度、大延伸率锚杆与锚索支护,提高围岩承载能力、适应围岩大变形;②加强支护:回采工作面后方一定范围内的沿空留巷采用高阻让压的单体液压支柱加强顶、底板支护,即在采空区顶板破断和沿空留巷围岩应力调整的剧烈阶段,通过单体液压支柱有效支撑顶底板、减小顶板回转、下沉和巷道底臃,保持沿空留巷围岩稳定;③沿空留巷围岩变形稳定后撤除作为加强支护的单体液压支柱。

关键词: 沿空留巷 巷内支护 基本支护 加强支护 锚杆支护

Support technology research and application inside roadway of gob side entry retaining

Abstract:

According to the situation of gob side entry retaining with the large and uneven deformation and poor support effects, took gob side entry retaining in Qinxin colliery as engineering background, dealt with the numerical simulation analysis the relationship between support inside roadway, surrounding rock deformation and stress distribution, and the obtained support mechanism inside roadway of gob side entry retaining are as follows: with the application of support with high resistance and yielding, increasing carrying capacity and deformation resistance of surrounding rock in roadway, adapting to large deformation and stress adjustment. The developed support technologies inside roadway of in gob side entry retaining are: ① basic support: using high strength bolt and anchor support owning high pre stress force, increasing carrying capacity of surrounding rock and adapting to large deformation; ② reinforced support: within a certain range behind working face, in gob side entry retaining, the hydraulic support with high resistance and yielding is used to strengthen roof and floor support, which means that in the intense stage of roof breakage and stress adjustment of surrounding rock of gob side entry retaining, the hydraulic support can be used to support the roof and floor effectively and reduce the rotating, sinking of roof and floor heave, maintaining the stability of surrounding rock in gob side entry retaining; ③ after the surrounding rock deformation stability in gob side entry retaining, the hydraulic support used as reinforced support can be removed.

Keywords: gob side entry retaining; support inside roadway; basic support; reinforced support; bolting

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