

论文

倾角变化对回采工作面区段煤柱应力分布的影响

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摘要:

依据平煤集团十三矿二 1 煤层的具体条件, 分别对煤层埋深300, 500, 800 m和倾角0, 25°, 30° 情况下运输巷下帮侧向压力分布规律和不同宽度区段煤柱受力情况进行了数值分析, 并对该矿12020采煤工作面下巷实体煤侧的应力、围岩变形及锚杆受力的情况进行了现场监测。结果表明: 随煤层倾角增大下区段运输巷与上区段回风巷两侧应力呈非对称分布, 采场顶板应力分布也是高度不均匀、不对称的, 侧向水平应力峰值随煤层倾角增大而增大, 且工作面后方增加幅度大于工作面前方; 峰值位置随煤层倾角增大而逐渐靠近煤壁。煤层倾角加大时, 应力明显偏向下区段运输巷, 使得下区段运输巷顶部出现明显应力集中, 并且随着煤层倾角的增大, 应力集中程度更加显著。

关键词: 倾角变化; 回采工作面; 区段煤柱; 应力分布

Stress distribution influence on segment coal pillar at different dip angles of working face

Abstract:

In accordance with specific conditions of coal seam II 1 in No.13 coal mine of Pingdingshan Coal Mine Group, on the buried depth of coal seam 300, 500, 800 m and dip angles of 0, 25°, 30°, side abutment pressure distribution rule of haulage roadway and the different width of coal pillar stress condition were analyzed by numerical simulation, through the site monitoring for the entity coal side stress under the lane, surrounding rock deformation and anchor stress situation at the mine working face 12020. The results show that with the angle of coal seam increased, both sides stress of lower section haulage roadway and upper section return airway present asymmetric distribution, stress distribution of stope roof is also uneven and asymmetrically high, the peak of lateral horizontal stress grows with the increasing angle of coal seam, and increasing extent behind working face is larger than ahead of the working face, peak position gradually approaches coal wall with the angle of coal seam increase. When the angle of coal seam increase, the stress obviously tends to lower section haulage roadway and the top of this position will appear significantly stress concentration problems, moreover, the difference has a larger trend with the angle of coal seam increase. The numerical analysis results are the same as the field sampling parameters and it is of great importance to the optimization of section pillar and roadway safe support.

Keywords: dip angle variation; working face; segment coal pillar; stress distribution

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