煤炭学报 2013, 38(03) 391-396 DOI: ISSN: 0253-9993 CN: 11-2190

论文

锚杆预紧力对节理岩体抗剪性能影响的试验研究

刘爱卿，鞠文君，许海涛，王洋

1.天地科技股份有限公司 开采设计事业部，北京100013；
2.煤炭资源高效开采与洁净利用国家重点实验室，北京100013

摘要：

利用配置的混凝土块体模拟围岩，采用节理直剪的方式，研究了40，80 kN两种预紧力下锚杆对节理岩体抗剪性能的影响。研究结果表明：随着预紧力的提高，锚固节理岩体的初期剪切刚度提高，对于抑制围岩的初期变形，提升锚杆支护效能有重要作用；随着预紧力提高，锚固节理岩体的变形呈阶段性特征，表现为急增阻、缓增阻和降阻3个阶段；井下试验结果表明，提高预紧力，锚杆的工作阻力得到提升，高预紧力全长锚固锚杆支护系统对于节理裂隙围岩的加固效果良好。

关键词： 锚杆预紧力；节理岩体；抗剪性能；裂纹扩展

Experimental study on the effect of bolt prestress on the-shear behavior of jionted rockmass

Abstract:

Concrete was used to simulate the real rock.The effects of bolt prestress on the shear behavior of jointed rock mass were studied with the approach of joints directly shearing in laboratory and situ.The results show that as the prestress improved，the initial shear stiffness of the rock mass is improved，playing an important role in inhibiting the early deformation of the surrounding rock and improving the performance of bolt supporting；As the prestress increased，the jointed rockmass presented phased characteristics，including three stages，such as rapidly increasing resistance，slowly increasing resistance and resistance reduction characteristics；Situ tests show that bolt resistance could be enhanced when the bolt prestress improved and highly prestressed fully encapsulated rock bolts achieved good results for jointed rock supporting.

Keywords: bolt prestress；jointed rockmass；shear behavior；crack propagation

收稿日期 2012-03-30 修回日期 2012-09-06 网络版发布日期 2013-04-02

DOI:

基金项目:

通讯作者: 刘爱卿

: 1986