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论文

组合方式对煤岩组合体力学特性和破坏特征影响的试验研究

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摘要：

为探讨组合方式对煤岩组合体力学特性和破坏特征的影响，利用MTS815岩石力学试验系统，分别对岩-煤-岩(YMY)、岩-煤(YM)及煤-岩(MY)3种组合方式试件进行了单轴压缩和三轴压缩试验研究。试验结果表明，组合体试件破坏主要集中在其煤体部分，而与组合和加载接触方式无关；煤体部分损伤发展和破坏程度的加剧，在一定程度上会诱导岩体出现损伤和发生破坏。单轴加载条件下，3种组合方式均表现为以煤体部分拉张破坏为主的破坏特征，YMY组合的平均抗压强度为40.03 MPa，分别是YM和MY组合方式对应平均值的1.80和1.53倍；三轴加载条件下，均表现为以煤体部分剪切破坏为主的破坏特征；随围压压力增加，各组合方式三轴抗压强度平均值逐渐趋近。

关键词： 组合方式；煤岩组合体；力学特性；破坏特征

Effects of combination mode on mechanical properties and failure characteristics of the coal rock combinations

Abstract:

To discuss the effects of coal rock combination mode on its mechanical and damaging characteristics, the uniaxial and triaxial compressive tests for three combination modes, such as Rock Coal Rock (YMY), Rock Coal (YM) and Coal Rock (MY), were carried out on MTS815 Rock Mechanics Testing System.The results show that the failure mainly concentrates on the coal part of combination specimen, and do not be affected by the combining mode and the loading condition.The development of damage and increase of failure extent in coal part can result in the emergence of damage and failure in rock part to some extent.The failure states are mainly tensile failure and happens in coal part for uniaxial compressive test.The uniaxial compressive strength of YMY is 40.03 MPa, which is 1.80 and 1.53 times of YM and MY, respectively.Under triaxial compressive condition, the failure are all mainly shear failure in coal part, and the average triaxial strength for three combination modes gradually approaches with the confining pressure increasing.

Keywords: combination mode; coal rock combination; mechanical property; failure characteristic

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