工程地质学报 JOURNAL OF ENGINEERING GEOLOGY

工程地质学报 » 2013, Vol. 21 » Issue (5): 716-721 DOI:

兰渝铁路上第三系弱胶结砂岩软化与变形机理探究

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SOFTENING AND DEFORMATION MECHANISM OF TERTIARY WEAKLY CEMENTED SANDSTONE ON LAN-YU RAILWAY

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全文: PDF (3577 KB) HTML (KB) 输出: BibTeX | EndNote (RIS) 背景资料

摘要 兰渝铁路上第三系砂岩成岩作用极差,具有泥质弱胶结、未胶结、石质极软的主要特点,在施工中表现出十分复杂的水稳特性,随硐室开挖含水率明显增大,易发生塑性变形或流变,围岩稳定性迅速变差,引起砂岩结构破坏,产生涌水、涌砂工程地质问题。本文采用岩石试验、电镜扫描及物探松动圈测试等方法,探究地下水渗流条件与围岩应力状态变化引起岩石微观结构的改变是其软化与变形的主要机理。

关键词: 弱胶结砂岩 岩石特征 水稳特性 渗流条件 微观结构 软化与变形机理

Abstract: Lan-Yu railway line has the Tertiary sandstone as the subgrade foundation. The sandstone has the characteristics of muddy weak cementation, unbound, low intensity, and shows water instability properties. It is very complicated in construction. Water content can increase significantly with the excavation of underground chamber. Plastic deformation and rheology, and stability of surrounding rock mass can rapidly vary, which can cause the sandstone structure damage, the inflows of water and sand, and other engineering geological problems. This paper uses the rock test, SEM and exploration of loose circle testing methods. It explores the groundwater seepage conditions and stress state of surrounding rock. The change due to rock microstructure change is the main mechanism of the softening and deformation.

Key words: Weakly cemented sandstone Rock characteristics Characteristics of water-stability Flow conditions Microstructure Softening and deformation mechanism

收稿日期: 2012-10-10;

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