

## 膨胀土在湿干循环和三轴浸水过程中细观结构变化 的试验研究

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## Meso-structural change of remolded expansive soils during wetting-drying cycles and triaxial soaking tests

摘要

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**摘要** 为研究膨胀土裂隙的产生及闭合规律,对重塑膨胀土进行了无约束条件下的3次湿干循环试验;再对湿干循环后的裂隙膨胀土进行了控制围压和偏应力为常数的CT-三轴浸水试验。研究表明:无约束条件下的膨胀土试样增湿和干燥都能引发裂隙的产生和闭合;在三轴浸水试验中,裂隙均趋于闭合,而闭合程度与应力状态有关;浸水过程中,试样体积变化可分为3个阶段,体积首先减小,接着因湿胀作用逐渐增大,尔后又因膨胀力释放和模量降低而减小;定义了结构修复参数,提出了三轴浸水过程中的土样结构修复演化方程。

**关键词:** 重塑膨胀土 湿干循环 CT-三轴浸水试验 结构修复演化方程

**Abstract:** In order to study the production and closure rules of cracks of expansive soils, tests of wetting and drying cycles are carried out for remolded expansive soils under non-confined condition, and CT triaxial soaking tests under certain confining pressure and deviatoric stress are then conducted. The results indicate that both the wetting and the drying of expansive soils can induce the production and closure of the cracks. In the triaxial soaking tests, the cracks tend to close, and the closure degree relates with the stress condition. During the soaking process, there are three distinct phases of volumetric change of samples, which decrease firstly, then increase rapidly under swell effect, and finally decrease with the release of expansive force and the reduction of modulus. Structural repair parameters are defined, and the evolution equation of structural repair in the triaxial soaking tests is proposed.

**Keywords:** remolded expansive soils wetting and drying cycle CT-triaxial soaking test evolution equation of structure repair

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