

Disintegration Resistance of Steep Rocky Slope Wall-Hanging Soil Based on High-Performance Ester Materials

Jin Liao^{1,2} Zhen Liu^{1,2} Cuiying Zhou^{1,2} Qingxiu Zhang^{1,2}

(1. School of Civil Engineering, Sun Yat-sen University, Guangzhou 510275, China;

2. Guangdong Engineering Research Centre for Major Infrastructure Safety, School of Civil Engineering, Guangzhou 510275, China)

摘要: The disintegration resistance of steep rocky slope wall-hanging soil is a crucial topic in the field of new ecological restoration. The formation of a transient saturated zone of wall-hanging soil under high-intensity rainfall can easily lead to soil disintegration. The subsequent rain erosion can cause the loss of growth substrate required for early plants, resulting in poor greening effect or even landslide. Therefore, improving the disintegration resistance of wall soil and ensuring the stability of the early plant growth environment are at the core of steep rocky slope protection. In this study, structural and static underwater disintegration tests of red soil modified by high-performance ester materials were carried out. According to the damage ratio of the soil structure and the disintegration rate and disintegration amount of red soil, the structural properties and disintegration resistance of improved red soil were quantitatively measured. The results show that absorbent high-performance ester materials generally increased the content of water-stable aggregates in red soil. However, when the content was excessively large, it destroyed the water-stable aggregates and accelerated the overall disintegration rate and amount. The optimal proportion obtained from the above experiments showed good adaptability and an improvement effect on the structural properties and disintegration resistance of red soil. This solves the problem of growth substrate required for early plant disintegration and loss in water. This paper provides a theoretical basis for the ecological restoration of steep rock slope wall-hanging soil with dis-integration resistance. It has guiding significance for the steady progress of greening construction on steep rocky slope sites.

关键词: High-performance ester materials; steep rocky slope; wall-hanging soil; disintegration resistance