

Effects of fly ash on the evaporation and cracking characteristics of soda soil

Binbin Yang¹, Jiawei Liu², xiaoming Zhao¹, and Sen Zheng¹

¹Xuchang University

²Henan University of Urban Construction

September 24, 2020

Abstract

Soil salinization seriously affects the movement of water in soil which then affects soil stability and sustainability in industrial and agricultural development. Fly ash, one of the most discarded solid wastes from coal-fired power plants, has been widely used as a recycled resource in recent years. The basic components of soda soil have been investigated through laboratory experiments. Soda soil samples with different amounts of fly ash are tested to study the changes in the characteristics of the material due to changes in water content and evaporation rate during drying. Changes in fractal and crack intensity factor are calculated based on digital image processing technology. The results show that the residual water content of soda soil increases from 8.55% to 16.22% with increases in the fly ash content. Fly ash can improve the water retention capability of soda soil, with a rate of increase of 89.68%. The average length of the surface cracks gradually decreases with increase in fly ash content, which indicates that fly ash can effectively inhibit the development of surface cracking in soil. The rate of cracking is an important measure for characterizing the development of cracks by measuring the area of the cracks. The crack area gradually decreases with increase in the fly ash content with different rates of cracking. The rate of cracking with a fly ash content of 10% is relatively slow, which indicates that 10% fly ash can effectively reduce cracking in soda soil thus resulting in a high residual water content.

Hosted file

20200922Manuscript.pdf available at <https://authorea.com/users/361226/articles/482709-effects-of-fly-ash-on-the-evaporation-and-cracking-characteristics-of-soda-soil>







