

Abstract

This study sought to establish diagnostic spectral characteristics in the short-wave infrared (SWIR) that could be used to classify soils in terms of their swelling potential. Three widely accepted soil-swelling indices, i.e. Atterberg limits, cation exchange capacity (CEC) and coefficient of linear extensibility (COLE), were used as controlling parameters to identify these spectral parameters. The results show that several spectral absorption feature parameters, namely position, depth and asymmetry, can be used in the classification on the basis of the discrete thresholds of these indices. The results show potential application of soil spectral characteristics in the construction industry and add a physical basis to the identification of clay mineral types dominant in engineering soils from currently used indices.