

This paper presents an experimental investigation on the strength behaviour of red clay improved by cement, considering initial water content (ω), cement content and curing pH levels. Along with the unconfined compressive tests, acoustic emission signals were detected to investigate the compression failure. It was shown that unconfined compressive strength (UCS) of the cement red clay rose first and fell later with water content increasing, and maximum UCS was reached at $\omega = 75\%$. As cement content increased from 15% to 30% under water content of 75%, UCS of blocks increased from 1.03 MPa to 6.09 MPa. Stress-strain curves of blocks curing in acid condition were divided into four stages: microcracks closure, elastic deformation and stable crack propagation, rapid crack growth and final failure. Acoustic emission signals detected in compression process showed that a large number of microcracks occurred in the second stage with more in the third stage.