

Detection of microcracks in rock specimens due to thermal changes using the acoustic emission method

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The acoustic emission (AE) method can detect microcracks that occur inside rocks. In this study, using the AE method, the temperature change of 80 °C at a temperature gradient of 2 °C/min was given to three kinds of rock specimens (granite, marble, and sandstone) often used for stone cultural heritages, and the microcrack formation was monitored. As a result, it was found that the AE amplitude was largest in the granite specimen and decreased in order of the marble and the sandstone specimens. The AE generation is thought to depend on the mineral composition, the thermal expansion properties of minerals, and the porosity.

Keywords: thermal weathering, microcrack, acoustic emission, thermal expansion property