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Salt efflorescence due to water-rock interaction on the surface of tuff cave in the Yoshimi-Hyakuana Historic Site, central Japan

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Artificial cave walls in Yoshimi Hyakuana Historic Site have been suffering from salt weathering since 1945 when the caves were made. To consider the processes of weathering and subsequent crystallization of secondary minerals, water-rock experiment using tuff from this area was performed. Rocks, surface altered materials, groundwater and rainwater were collected, and chemical and mineralogical characteristics of those samples were investigated. The XRD and SEM-EDS analyses were carried out for the solid samples and ICP-OES analysis was performed for the solution generated from the experiment, groundwater and rainwater. Gypsum is detected in original tuff, and on grey and whiter coloured altered materials. General chemical changes were observed on this rock. However, it is found that purple and black altered materials were mainly made due to microbiological processes.