

SCG064-P04

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## Dissolution roughness of gypsum blocks: change in characteristics of roughness patterns with friction velocity and flow

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The dissolution roughness formed on some materials by flows such as stream flows and wind flows is considered to be controlled by the flow velocity, properties of bed sediments, and flow duration. Because it is difficult to perform studies on outcrops, most studies are carried out in laboratories (Allen, 1971; Blumberg and Curl, 1974; Curl, 1974). These studies have revealed the characteristics of roughness patterns affected by flow velocities and have visualized the flows that have acted on a bed surface. In this study, we performed erosion (dissolution) experiments by focusing on the friction velocity and flow duration. The substrate used in the experiments was made of plaster of Paris (gypsum) because of its low solubility and ease of casting. Fresh tap water was flown over the gypsum blocks.

The dissolution roughness induced on the surface of the gypsum blocks varied widely with the friction velocity and flow duration. Most of the dissolution roughnesses in the experiments are scallop-like patterns with various scales. The length of the scallops reduced as the friction velocity increased, whereas the widths of the patterns hardly changed. Although the patterns gradually spread uniformly on the entire surface of the bed when the flow duration increased, the size of the patterns showed no obvious change. The results suggest that the characteristics of roughness patterns strongly depend on the friction velocity whereas their distribution depends on the flow duration.

Keywords: dissolution roughness, friction velocity, flow of time