

Microbial and physicochemical steps leading to the mineralization of the Great Salt Lake microbialites

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The Great Salt Lake (Utah, USA), is a partly rainfed endorheic hypersaline (average salinity: 140g/L) lake. Extant microbial mats and microbialites are found on shore of the western margin of Antelope Island. SEM, Cryo-SEM, EDX and Confocal Raman have been used to study the micro- to nanoscale properties of these lithifying mats. Our results show different steps of mineralization that are associated with different mineralogies. Clay, aragonite and dolomite are the successive mineralogical phases that were observed. We present a conceptual model in which this progression of mineralogies is explained in the context of multiple intrinsic and extrinsic controlling factors. In addition to microbial activity, these factors include variations of the water level, water geochemistry, pH, and temperature as well as the properties of the organic matrix.

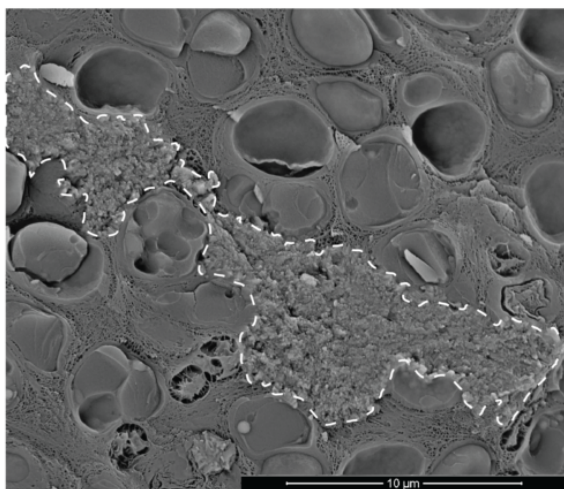


Figure 1: Carbonate mineralization in organic matrix