

Seasonal Changes in Sabkhas: Linking Microbes, Geochemical Conditions and Dolomite Formation

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The model of dolomite precipitation in sabkhas proposed in the 70's suggests dolomite formation as a result of evaporation in a hypersaline environment. This increases Mg/Ca ratios in porewater and initializes replacement of pre-existing carbonates. More recently a biotic or microbial model showed the involvement of extropolymers (EPS) in mineral formation by reducing the activation energy of precipitation. (eg. Roberts et al., 2013).

These two mechanisms are not exclusive and are in fact closely related as both high Mg/Ca ratios and an organic catalyst such as EPS are important for low-temperature dolomite formation.

However, until now most studies have been constrained to a laboratory setting. To close the gap between this setting and the natural environment, our study aims to evaluate these processes *in-situ* using high precision geochemical and molecular biological techniques.

Analysis of two dolomite forming environments within hypersaline sabkhas in Qatar, over three samplings times has shown that seasonal fluctuations in environmental conditions are a key factor in dolomite precipitation. More specifically changes in these conditions (ie., salinity) shift geochemical conditions, impacting the microbial community and are directly linked to dolomite precipitation.