

Sulphur and oxygen isotope effects during dissimilatory sulphate reduction

B. BRUNNER¹

¹ Max-Planck-Institute for Marine Microbiology, 28359 Bremen, Germany (bbrunner@mpi-bremen.de)

The sulphur and oxygen isotope composition of sulphate is a very successful tool to identify sulphur sources (e.g. sulphates and sulphides), to elucidate processes that produce sulphate (i.e. oxidation of sulphur compounds) and to quantify their respective contribution.

In contrast to this story of success, our understanding of what causes sulphur and oxygen isotope fractionation is still very limited. For example, we know that dissimilatory sulphate reduction (DSR) causes sulphur isotope fractionation as well as oxygen isotope exchange between sulphate and water. However, the controls on the magnitude of these effects are not fully understood. In recent years, it has become evident that reversibility of DSR dominates the expression of isotope effects. This presentation introduces the concept of reversibility of enzymatic pathways. The opportunities that arise when investigating sulphur and oxygen isotope effects in sulphur cycling in the light of this framework are addressed.