

## **How does the $^{17}\text{O}$ excess of carbonates relate to their source waters? Examples from biogenic and abiogenic minerals**

CASEY SAENGER<sup>1,2</sup>, ANDREW J. SCHAUER<sup>2</sup>, JULIA R. KELSON<sup>2</sup>, KEITH R. HODSON<sup>2</sup>, ERIC J. STEIG<sup>2</sup>, KATHARINE W. HUNTINGTON<sup>2</sup>, ANNE M. GOTHMANN<sup>3</sup>

<sup>1</sup>Joint Institute for the Study of the Atmosphere and Ocean, University of Washington (csaenger@uw.edu)

<sup>2</sup>Department of Earth and Space Sciences, University of Washington

<sup>3</sup>School of Oceanography, University of Washington

Recent analytical advances allow the  $^{17}\text{O}$  excess of carbonate minerals to be measured with unprecedented precision, raising the possibility that its variability in geologic archives could serve as a valuable paleohydrologic proxy. A critical step toward realizing this potential is an evaluation of how carbonates record the triple oxygen isotope composition of the waters from which they precipitate. To address this gap in knowledge, we conducted a series of abiogenic experiments that precipitated carbonate from solutions with known, and widely varying,  $^{17}\text{O}$  excess values at temperatures of  $\sim 5$  and  $25^\circ\text{C}$ . Using a method based on the catalyzed exchange of  $\text{CO}_2$  with  $\text{O}_2$  over hot platinum, results from these experiments will allow us to evaluate if relative differences in the  $^{17}\text{O}$  excess of  $\text{CO}_2$  evolved from carbonates reliably track those of their parent waters, and whether this relationship depends on temperature. To evaluate the degree to which abiogenic relationships may be modulated by biological vital effects, we also present preliminary data on the  $^{17}\text{O}$  excess of biogenic carbonates grown in waters of known triple oxygen isotope composition.