Stable isotopes of a speleothem from Helictite Cave, Virginia

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Abstract

The δ13C and δ18O trends were constructed for the upper portion of a stalagmite collected from Helictite Cave in Virginia. The speleothem, in its entirety, records four periods of growth and is Th-230 age dated from 64 ×18 yr BP at its top to 126,880 ×705 yr BP at its base. The top of the speleothem to the first hiatus represents ~700 years of growth and stable isotope values in the interval range from -9.87 to -4.05 ‰ (vs. V-PDB) and -7.31 to -4.43 ‰ (vs. V-PDB) for δ13C and δ18O respectively. The δ18O values vary in a periodic manner, reaching relative maxima roughly every 100 to 140 years. The δ13C trend shares two notable increases with the δ18O trend and may represent periods of drier conditions. These measurements and observations represent the initial stage of characterizing the speleothem with the ultimate goal of generating a well constrained isotopic record that can be correlated to similar proxy records.