ISOTOPE GEOCHEMISTRY OF THE CHERT IN THE ST. JOE AND BOONE FORMATIONS, LOWER MISSISSIPPIAN, SOUTHERN MID-CONTINENT

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ABSTRACT

The Lower Mississippian interval in the southern mid-continent region is comprised of the chert-bearing carbonates of the St. Joe and Boone Formations. The source of the silica for these cherts has long been debated, as well as the mode of formation for the chert. Review of previous literature concerning the origin of the silica in these cherts primarily points to a biogenic origin, such as silica secreting organisms including sponges, radiolarians, and diatoms. Other hypotheses include crustal weathering with river transport, hydrothermal venting, eolian dust, and altered volcanic ash. This study hypothesizes that the silica is more likely to be volcanogenic—derived from volcanic ash contributed by an island arc associated with the Ouachita Orogenic belt. Isotopic data allows us to better understand source characteristics as well as compare the chert to other chert isotopic signatures. Building a collection of data on this interval will provide insight into the silica provenance as well as improve the current understanding of the tectonic history of the Ouachita Orogeny.

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