

## **U-PB DATING OF CHERT FROM MISSISSIPPIAN PALEO-CALICHES, EASTERN KENTUCKY USA**

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Up to twelve, Late Mississippian (Early Carboniferous), high frequency sequences formed in the Appalachian foreland basin (eastern USA) in a dominantly arid to semi-arid climate. Caliches formed up-dip in eastern Kentucky on regionally mappable, sequence bounding disconformities. We tested samples of caliche crusts from this sequence for U-Pb dating potential by measuring Pb isotopic compositions. None of the calcite from the sampled caliche horizons has yielded radiogenic Pb values. However, fission track maps of thin-sectioned caliche reveal that the uranium is concentrated in chert, which replaces paleo-caliche. We assume that this replacement occurred near the time of formation of caliche based on localization of the chert in paleosol horizons. With future petrographic work, the relative timing of chertification can be related to published carbonate cement stratigraphy. We sampled chert with an outer chalky, porous zone, and an inner dense, vitreous zone. While the outer porous zone exhibits open system behavior, the U-Pb systematics of the vitreous chert suggest that it behaved as a closed system. The chert has concentrations of approximately 15 ppm U and 1 ppm Pb. Initial results, based on two analyses of the vitreous chert, give an age of about 350 Ma. This age is slightly older than the Meramecian age that is recognized using biostratigraphy. We expect that careful sampling of phases within these zones should yield promising archives of geologic time.