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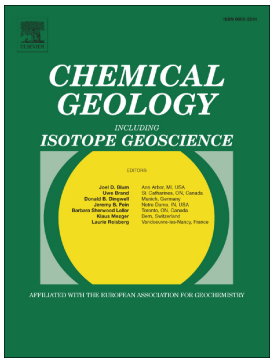

Tungsten-182 in the upper continental crust: Evidence from glacial diamictites

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Tungsten-182 in the upper continental crust: Evidence from glacial diamictites

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Abstract

Study of igneous and sedimentary rocks that may be representative of the chemical and isotopic characteristics of portions of the upper continental crust (UCC) has provided important insights to the origin and growth of the continents, as well as the large-scale chemical evolution of the silicate Earth. For example, changes in the major and trace element compositions, as well as long-lived radiogenic isotope systematics of (meta)sedimentary rocks through time have led to the conclusion that at least some portions of the Archean UCC were enriched in mafic-ultramafic components compared to UCC with younger provenance (Taylor and McLennan, 1985; Condie, 1993; Gaschnig et al., 2016; Chen et al., 2016; Tang et al., 2016; Garçon et al., 2017). Short-lived radiogenic isotope systems are an additional means of tracing the contributions of diverse mantle-derived components to the UCC. Tungsten-182 anomalies have been observed in both ancient and modern rocks. Although these anomalies were ultimately created by processes that occurred while ^{182}Hf was extant during the first ~60 Ma of Solar System history, the causes of their incorporation and preservation in the rock record, as well as the frequency and distribution of rocks in the UCC with isotopic anomalies remain poorly understood. Here, μ^{182}W values