

CONTAMINATION OF KEWEENAWAN FLOOD BASALTS IN THE MIDCONTINENT RIFT, NORTHCENTRAL USA

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Midcontinent Rift igneous rocks show variable amounts and types of contamination. The North Shore Volcanic Group (NSVG) in Minnesota contains strongly negative ϵ_{Nd} rhyolites formed by crustal melting that are richest in incompatible elements Ba, K, Rb, and Th, in order of relative enrichment. Essentially all of the NSVG basalts are near ϵ_{Nd} values of 0, and are largely uncontaminated by crustal sources. However, some Mamainse Point (MP) basalts in Ontario have variable ϵ_{Nd} values and are enriched in Th, Rb, K, and Ba, in order of relative enrichment. Differences in incompatible element enrichment patterns indicates the MP basalts assimilated crustal rocks with compositions different from those forming the crustal melts in the NSVG. The compositional relationship between contamination source and product is readily observed in the Silver Creek dike north of Duluth where elemental contamination patterns are similar to those in overlying felsic flows of the NSVG.