Geochemical and isotopic insights in Precambrian geology – examples from the Kaapvaal and Wyoming cratons.

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Case studies are presented to illustrate the combined application of whole rock and mineral geochemical and isotopic data to decipher crust formation and modification in Archaean cratonic settings: Nd-Hf-O isotope systematics document seafloor alteration and reworking in an ultramafic layered complex in the Kaapvaal Craton. Multi-mineral petrochronology is used to infer high-grade metamorphism, compositional modification and cooling in the lower crust of the Wyoming Craton. Lead and multiple S isotope systematics constrain timing and sources of mineralization in the Phalaborwa carbonatite-phoscorite complex (Kaapvaal Craton).