

Cenozoic Mantle-Plume Magmatism of the Tuyon Basin, The Southern TianShan:

Evidence from Geochemistry Data of Alkalic Basalts

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The Tian Shan forms a typical intracontinental mountain belt; The ancestral Tian Shan formed in late Carboniferous-Permian time during tectonic amalgamation of the Tarim and Tian Shan block and the Siberian craton. A Series of basaltic extrusive and intrusive units emplaced primarily in Late Cretaceous-Paleogene sedimentary rocks in the tuyon basin and its adjacent area, Southern Tian Shan. The Sr, Nd, Pb isotopic geochemistry data of basalts shows low Sr and Pb isotopic values and relative high Nd values ($^{87}\text{Sr}/^{86}\text{Sr}=0.703554-0.703884$; $^{143}\text{Nd}/^{144}\text{Nd}=0.512838-0.512904$; $^{206}\text{Pb}/^{204}\text{Pb}=18.0063-18.4720$; $^{207}\text{Pb}/^{204}\text{Pb}=15.4411-15.5060$; $^{208}\text{Pb}/^{204}\text{Pb}=37.8072-37.9290$). The major elements, trace elements and rare earth elements geochemistry data indicates these basaltic rocks are similar to alkaline basalts of oceanic islands of the Hawaiian Type. According to the Nd/Sr isotopic ratio, The Tuyon basalts may originate by low-grade melting of a source (mantle plume) similar to that beneath the Hawaiian Islands. In the Tuyon basin and adjacent area, several fields of the Cenozoic alkaline basaltic magmatism may be related to the Cenozoic activity of mantle plumes.